THE USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING

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BEFORE THE
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OF THE
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THE USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING

TUESDAY, OCTOBER 13, 1981

House of Representatives,
Committee on Science and Technology
Subcommittee on Science, Research and Technology,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:10 a.m., in room 2318, Rayburn House Office Building, Hon. Doug Walgren (chairman of the subcommittee) presiding.

Mr. Walgren. I want to welcome all of you to our hearing today on the use of animals in medical research and testing. This is a very important hearing because we are asking the sensitive question "What is the proper balance between freedom of inquiry in medical research and the suffering of animals used in experiments?" At issue are the values and ethics of science and the public support necessary for the scientific community to secure the benefits of science for mankind.

There is broad feeling that the pain and suffering of animals used in scientific research and testing should be reduced to an absolute minimum. I share that feeling and regard it as a critical consensus about the respect due all life in its many forms.

This hearing is not simply on the question of how animals are treated and cared for by scientists. We are exploring the more difficult question of when and under what circumstances the use of live animals is justified.

A number of pieces of legislation have been referred to this subcommittee to protect animals in research settings, as well as to develop research alternatives which do not use live animals. Many organizations and individuals have provided us with excellent ideas on how best to achieve these goals, and many of you are in the audience today. On behalf of the subcommittee, I want to thank you in particular for your interest.

With these ideas and the record of these hearings, we plan to try to formulate legislative proposals which I hope will draw wide support from other Members of Congress as well as from both the scientific and nonscientific communities.

There is no doubt that there have been and continue to be cases where animals used in research and testing have not been given the dignity and care which most of us feel they deserve. Many of our witnesses will describe abuses which they understand exist. A recent incident involving allegations of improper care and use of monkeys at a Silver Spring, Md., laboratory has captured the attention of the Washington area. We have with us today a young man who first called public attention to the conditions at that Silver Spring laboratory. We also invited the director of that laboratory, but he has declined to appear on the advice of counsel, due to the pending criminal proceedings arising out of that incident.

I want to stress, however, that our hearing is not primarily to discuss who may or may not be at fault with the problems at Silver Spring. There are many, much broader matters that we must face as we consider legislative action, including the following questions:

First, what is the best way to promote more humane and appropriate use of animals, including alternatives to animal use?

Second, how can we best build and maintain respect for animal life and welfare in the process of planning and carrying out scientific research and testing?

Third, how can we distinguish those areas in which animal-based research or testing remains crucial to the protection of human health or the advancement of knowledge and training from those in which alternative approaches could just as well be used?

Fourth, how do we weigh the value of a gain in scientific knowledge against the impact of animal suffering that is inherently involved?

Fifth, what procedures does the Government use in approving funding for research involving animals that insures that animals will not be inappropriately used?

Sixth, what areas in animal welfare need most improvement? Where are the resources for regulatory efforts or physical improvements going to come from?

Seventh, can our formal testing methods of health effects testing be changed to minimize use and abuse of animals?

And eighth, can new testing methods or means of processing information help us to cut down on the use of animals in testing or instruction?

On the subject of developing alternative testing methods that do not use animals, there are some encouraging beginnings. One is the establishment of the Johns Hopkins Center for Alternatives to Animal Testing, to be located in the University's School of Hygiene and Public Health. It should be noted that that school was made possible by a $1 million grant from the Cosmetic, Toiletry, and Fragrance Association. This follows a $750,000 grant given by Revlon to Rockefeller University last year to work toward the same goal, as well as a recent $100,000 grant to Tufts University Medical School by the New England Anti-Vivisection Society, and $176,000 to the Medical College of Pennsylvania in Philadelphia by the American Fund for alternatives to Animal Research.

I believe that everyone, scientists and nonscientists alike, should have the same goals in mind. The first of these goals is to reduce as much as possible the number of animals used in research and testing by placing emphasis on alternatives to animal use, and secondly, by giving more thought to the limited circumstances when the use of animals may be justified. And third, we need to make sure that the proper conditions for their treatment and care exist when animals must, under those circumstances, be used.

It would have been easy for this subcommittee to duck this issue. And yet, as chairman of the subcommittee, I personally believe there is no more important subject for us to give our attention to.

Before introducing our first witness, I should like to insert in the record opening statements of Mrs. Heckler, the subcommittee's ranking minority member, and ranking member, Mr. Brown.

[The opening statements of Mrs. Heckler and Mr. Brown follow:]

HONORABLE MARGARET M. HECKLER
OPENING REMARKS FOR THE HEARINGS ON THE USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING
13-14 OCTOBER 1981

THANK YOU, MR. CHAIRMAN. I THINK YOUR OPENING STATEMENT REFLECTS THE VIEWS OF BOTH SIDES OF THE AISLE ON THE SUBCOMMITTEE. WE ARE ALL DISTURBED BY BOTH THE INHUMANE AND UNNECESSARY USE OF AMINALS IN RESEARCH AND TESTING. NATURALLY, WHERE ADJUNCT OR ALTERNATIVE RESEARCH AND TESTING METHODOLOGIES ARE ACCEPTABLE TO THE SCIENTIFIC COMMUNITY, WE WOULD ENCOURAGE THEIR FULL UTILIZATION.

UNFORTUNATELY, AND WITH SOME MEASURE OF SURPRISE, WE FIND THAT THE SCIENTIFIC COMMUNITY IS NOT ALWAYS AT CONSENSUS ON THESE ISSUES. SUBSEQUENTLY, THESE ISSUES ARE SOMEWHAT INTRACTABLE. I MIGHT ADD THAT THE ANIMAL WELFARE COMMUNITY IS FAR FROM CONSENSUS AS WELL. SO FAR, IN FACT, THAT IT APPEARS DOUBTFUL THAT ANY ONE LEGISLATIVE MECHANISM WILL RECEIVE THEIR FULL SUPPORT.

IT IS IN THIS TURBURLENT ATMOSPHERE THAT THIS SUBCOMMITTEE, UNDER THE COURAGEOUS LEADERSHIP OF CHAIRMAN WALGREN, PURSUES THIS ISSUE IN THE FOLLOWING TWO DAYS OF HEARINGS. THE SUBCOMMITTEE HAS MADE A SIGNIFICANT EFFORT TO BRING ALL SIDES OF THIS ISSUE TO THE WITNESS TABLE.

I AM PLEASED TO SEE NANCY PAYTON FROM THE MASSACHUSETTS SPCA ON THE WITNESS LIST, ALONG WITH DR. SHELDON WOLFF FROM

TUFTS UNIVERSITY COLLEGE OF MEDICINE. I ALSO NOTICED THAT THE BOSTON BASED ASSOCIATION FOR BIOMEDICAL RESEARCH IS REPRESENTED IN TOMORROW'S HEARING. I SHOULD ALSO NOTE THAT THE NEW ENGLAND ANTIVIVISECTION SOCIETY, WHILE NOT ABLE TO TESTIFY IN PERSON, HAS PROVIDED AN EXCELLENT STATEMENT FOR THE RECORD WHICH WILL BE INCLUDED IN THE PRINTED PROCEEDINGS OF THE HEARINGS.

I WOULD AGAIN LIKE TO THANK THE CHAIRMAN FOR PROCEEDING WITH THESE HEARINGS, AND FOR THE MANY WITNESSES WHO HAVE DEVOTED CONSIDERABLE TIME AND EFFORT IN THE PREPARATION OF THEIR STATEMENTS. I LOOK FORWARD TO THESE HEARINGS, AND TO THE SUBSEQUENT ACTIONS OF THIS COMMITTEE FOR THE PROTECTION OF THE HUNDREDS OF THOUSANDS OF ANIMALS USED IN RESEARCH AND TESTING EVERY YEAR.

OPENING STATEMENT OF HON. GEORGE E. BROWN, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

It is with particular pleasure that I attend these hearings today. Last February I keynoted a conference convened by the National Institutes of Health on the subject of animals in research entitled Trends in Bioassay Methodology: In vivo, In vitro, and Mathematical Approaches. That conference, which was an outgrowth of this subcommittee's long-standing concern about life and research, served as a learning experience for me and heightened the awareness of all those involved on how we use animals in research, what they are used for, and the alternatives that exist.

I believe that the earmark of a civilized society is the care that it takes of its sick and its helpless. In the case of the use of animals in research, this compelling responsibility of society becomes one fraught with conflict. The scientific questions are difficult ones, and will not yield for quick and easy solutions. The moral issues are not at all straightforward; just people may reasonably differ on certain questions. Clearly, in an era of ever increasing numbers of new drugs and chemicals, it is critical that we find acceptable ways of testing for their safety, quickly and effectively.

I hope that the advocates of various points of view will gain from each other and that out of their dialogue comes some practical, and moral advice to those involved in this field. I also hope we can find, and I will look, for appropriate legislative vehicles to accomplish this end.

Mr. **WALGREN**. With that, I want to turn to the first witness this morning, the Honorable Robert Roe, a Member of Congress from New Jersey. There are a number of Members of Congress who have been particularly concerned about the problem of animal suffering and the use of animals in testing. Mr. Roe is one of the foremost of these. He has introduced legislation on this subject which we will be considering in each of its details. I want to welcome you and thank you for coming on a day when many Members of Congress are not in town. I invite you to proceed.

STATEMENT OF HON. ROBERT A. ROE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. Roe. Thank you, Mr. Chairman. I enjoy being with you this morning. And may I take this opportunity to express to you and our colleagues who are participating this morning of the extensive courage that is being shown by this subcommittee in tackling what I believe to be an emotionally difficult situation.

But I think you struck the theme this morning when you used the words "proper balance," and I will speak to that as we proceed. Therefore, I want to thank you for the opportunity to appear before the Science, Research and Technology Subcommittee this morning to discuss legislation I have introduced regarding the use of live animals in medical research and laboratory testing.

My bill, H.R. 556, the Research Modernization Act, which currently has over 81 cosponsors here in the House—and, by the way, which has been strongly promulgated by Representative Richmond from New York and Representative Hollenbeck from New Jersey over a number of years, would require the development of alternatives, where possible, to procedures which utilize live animals for testing and experimentation.

May I digress there, Mr. Chairman, for a moment. We use the word "where possible." I have read different reports that say this is a crazy idea and what we are trying to do is set science back and so forth. Nothing could be further from the truth. I don't think there is anyone who understands the scientific approach better than we do, that there is a certain amount of animal testing that will have to be carried out. What we are saying is excessive testing, the suffering of animals, and also the enormous economics involved and duplications of efforts must be ended.

Therefore, basically H.R. 556 would establish a center for alternative research in the National Institutes of Health to coordinate the development and standardization of testing methods which do not use live animals. This center will be a coordinating agency, similar to the National Toxicology Program, consisting of representatives from each Federal agency which sponsor research and testing.

Because it is generally accepted that many nonanimal using alternative methods are less expensive, faster, and as accurate as procedures which use animals, their use will provide public health benefits through more reliable identification of health hazards in the environment or in food, drug, and cosmetic products.

Mr. Chairman, the response to the introduction of this bill has been overwhelming. Concerned citizens from around the Nation have literally deluged my office with hundreds of letters in support of our efforts to get this badly needed bill enacted into law.

Over the past several years there has been an increasing amount of attention and concern focused on the use of live animals in scientific research. Investigations have shown that in many cases animals are subjected to great pain in experiments that have little relevance to the betterment of human lives.

Many scientists involved in Federal research projects have admitted that live animal experimentation is inadequate to monitor the hundreds of new substances entering the environment every year. The Center for Alternative Research that would be established under H.R. 556 would utilize such alternatives to the use of live animals as tissue cultures, computers, and lower organisms. For example, there are computers being used in this country today that can duplicate most functions of the human body and provide scientists with a detailed analysis of what happens when foreign substances are introduced into the human system.

In Scotland, scientists make use of a special tissue culture process that prevents the unnecessary death of an estimated 5,000 animals a week due to animal research. This process grows cells in 2 or 3 weeks, while that same growth would take months to develop in live animals.

In this Nation the Ames test is widely used in cancer, birth defects, aging, and heart disease research. In that procedure, salmonella bacteria are placed in a petri dish with an enzyme which will act upon foreign chemicals much as enzymes do in the human body. A DNA or gene-changing chemical is added and the bacteria are observed for changes.

The Ames test takes from 48 to 72 hours and costs a few hundred dollars, whereas a similar animal test takes 2 to 3 years and costs at least $150,000. The Ames test disclosed the chemical dangers in the fire retardant fabric Tris more than a year before the U.S. Consumer Products Safety Commission ordered the removal of 20 million children's sleeping garments from the market on the basis of animal tests.

The Harvard Medical School health letter noted in its September 1979 issue that:

> Crude as they may be, animal tests are expensive and time-consuming and they present a formidable barrier to anyone hoping to test all the thousand-odd chemicals introduced each year, not to mention those already in use.

What it comes down to is that a considerable amount of live animal experimentation could be eliminated on scientific, fiscal and on humanitarian grounds.

Currently an estimated $4 billion in Federal tax money is spent each year on animal experimentation. The present administration has made Federal budget cutting its prime economic objective. H.R. 556 certainly meets those goals in our judgment. It would not cost any additional Federal funds to establish the research center. We believe the reprograming of funding available could accomplish that goal; 30 to 50 percent of present research funds could be utilized in developing alternative methods of testing, producing a further decrease in the tax funds devoted to animal experimentation.

The actual numbers of animals used for testing purposes is staggering. Official figures compiled by the National Academy of Sciences shows that some 29 million animals were used in tests and experiments during fiscal year 1978. But the Academy is quick to note that 29 million represents only the number of animals utilized in tests that were reported to the National Institutes of Health. The more realistic figure is that some 60 million animals a year will die in the course of scientific research.

One point must be made very clear. This legislation does not in any way call for an immediate end to all live animal experimentation. Nothing could be further from the truth. Until responsible alternatives to animal experimentation are found, animal experimentation in essential areas such as cancer research and the study of other human diseases must continue.

But according to a prominent group of scientists who attended a 3-day conference on animal experimentation, sponsored by the National Institutes of Health earlier this year, computers and test tubes are the wave of the future in scientific research. All 30 scientists attending the conference noted the limitations on animal testing.

For example, Dr. Frank Schabel, Jr., director of chemotherapy research at Southern Research Institute in Birmingham, Ala., told the conference—and I quote—"Animals are expensive, difficult and variable. No animal tumor has been shown objectively to be a reliable predictive for the drug response of any human tumor."

That is an important point to note. Time and time again it has been shown that test results on animals are not automatically transferrable to humans.

Several important cases to substantiate this point come to mind, such as the recent swine flu vaccine program. Although every lot of the vaccine was safely tested by both the FDA and the manufacturer on both guinea pigs and mice, over 1,000 people were struck with Guillain-Barre syndrome and 66 others died.

The most tragic example, of course, is the thalidomide pill that was given extensive animal testing on several species before being approved for use among pregnant American women. The deformed children that were born as a result of that medication clearly outlines the dangers associated with transferring animal experimentation to human responses.

The chemical culprit in red dye No. 2 didn't cause cancer in animal tests, although its carcinogenic properties showed up immediately in the Ames test.

Other examples abound—penicillin kills guinea pigs, digitalis raises the blood pressure of dogs, morphine excites cats. Yet many continue to insist there is no better way to study human disease than through animal experimentation.

A major breakthrough occurred recently, as you commented in your opening address, Mr. Chairman, when the Revlon Co., which has been loudly criticized for its animal research program, announced it was giving a $750,000 grant to the Rockefeller University in New York to find a scientific alternative to the Draize eye irritancy test that blinds rabbits during the testing of cosmetics.

Mr. Chairman, our daily newspapers are constantly printing articles detailing one form of animal abuse or another in the name of science. The most recent example which comes to mind is the case of the 17 monkeys who were taken from a Maryland laboratory under court order after it was charged they were being subjected to the greatest of cruelties. I know you will be directing attention to that this morning.

We all know the cases of animal mistreatment in laboratories and I will not outline them here. The point to be made is that we must consider the humanitarian aspect of animal experimentation in dealing with this most sensitive of subjects.

I would like to quote Prof. Bernard Rollin, a biophysicist at Colorado State University, who said—and I quote: "We ought to legitimately demand of all uses of animals in research that the benefits to humans outweight the pain and suffering experienced by experimental animals."

If we can dramatically reduce the number of animals who must die in the name of science, while at the same time increasing our medical research expertise through technology, we will certainly have achieved a great deed.

I thank you again, Mr. Chairman, for the opportunity to appear before you and our colleagues today, and I would be glad to answer any questions you may have.

Mr. **Walgren**. Thank you very much.

I think at this point I would invite Congresswoman Schroeder to join you at the table. Mrs. Schroeder has been active in this area and has drafted and submitted legislation that is relevant. I think it would be helpful to hear you both at the same time.

Welcome to the committee, Mrs. Schroeder, and please proceed as you like.

STATEMENT OF HON. PATRICIA SCHROEDER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO, ACCOMPANIED BY ROBERT F. WELBORN, ATTORNEY AT LAW

Mrs. **Schroeder**. Thank you very much, Mr. Chairman. I want to compliment the committee for dealing with this issue.

I think it is very easy to talk about the problem. It is always much harder to find a solution. I think that we have a potential solution here, so I am pleased to be able to bring this to your attention.

First of all, I would like to tell the people in the room that there will be a 5-minute tape this afternoon in the House recording studio. It is only 5 minutes, but I must say, as a rating, it is probably X-rated. It is not very pleasant to watch. It will be in the House recording studio at 2:30 and it is about animals in research. I think a lot of people might like to see it. I think it really tells people what it is that we're talking about.

I am awfully pleased that you are looking at the issue of the use of animals in research and testing, and I agree that it is probably important to someday look for alternatives to the use of animals. But my bill doesn't do that. Nor does it attempt to infringe on the freedom of researchers. What it does attempt to do is to reduce the subjection of animals to unnecessary pain as determined by the researchers themselves, which I think is terribly important because many of the researchers I know are as concerned about this problem as the people in animal welfare.

The bill was initially drafted by four attorneys, a practicing veterinarian, a laboratory animal veterinarian, a research veterinary surgeon, and a teacher of ethics to veterinary, medical, and postgraduate bioscience students and other people in the field of lab animal research. These men are professionals.

The gentleman to my left here is one who has been out front on this forever. His name is Bob Welborn. He helped draft a bill similar to this that was introduced in the Colorado State Legislature. The group of professionals I speak of are from the Colorado State University, which has an excellent reputation—in fact, Congressman Roe is even quoting someone from there. So I think——

Mr. **Roe**. Colorado is a great State.

Mrs. **Schroeder**. Colorado is a great State. These professionals have become aware of the balance that is needed and can be struck between academic freedom and animal welfare. We have incorporated that balance in H.R. 4406.

This bill isn't all that new. It is based on the National Institutes of Health guidelines, and on the Department of Agriculture Animal and Plant Health Inspection Service regulations. Dr. David H. Neil, who is the director of animal care at Colorado State University, and a member of that group of professionals that I mentioned who drafted the bill—I would like to take the credit. My name is on it but, unfortunately, they did the work. But they know a lot more about it.

When he was drafting the bill, he made the following comment: "The emphasis this time, however, was not to be on inspection, detection, and punishment, but rather—" the professionals decided it would be better to emphasize the prevention of possible problems by a sound and auditable system of in-house peer review and control.

That is not only a more effective approach, but in this day and age it is almost essential, because we all know that if you come up with something that is going to require a lot of new Government personnel, it is never going to get off the ground. So what Dr. Neil and the others came up with, this bill that has my name on it that I wish I could say I wrote, is a bill that recognizes the legitimate concerns of researchers as well as those in the animal welfare community and strikes a balance.

Most researchers I have talked to acknowledge a need to prevent and to protect lab animals from unnecessary pain and suffering. They do not like the kind of thing that they saw in Montgomery County. Nobody is pleased by that. They all get painted with a broad brush and the responsible ones get condemned along with the irresponsible ones.

So what we are doing here is putting together a system of oversight where the researchers themselves are involved.

Let me summarize just four major points. First the bill establishes in each animal care facility or research facility an animal care committee of five members who are employees of that facility. This is not a new idea. The National Institute of Health guidelines require such committees but the bill puts these requirements into law and insures that all research facilities are covered.

Second, it provides a working definition of pain, and requires that research animals be properly anesthetized before being subjected to such pain, unless—and there are two exemptions which the professionals all think they can live with—unless the pain is a result of a routine procedure defined in the bill, or the animal care committee certifies that such anesthetization would interfere with the experiment.

Third, it expands the number of animals that would be protected under the law to include all vertebrates, including rats and mice. But it does exempt horses and farm animals. We are basically concerned with research animals and all vertebrates are covered.

Last, it eliminates the discretion of the Secretary of Agriculture to exempt certain research facilities and teaching institutes from the law. We should have these standards and they should be uniform.

I think it is of special interest that a group of professionals were able to put this bill together. I think it allows us to, No. 1, start reducing the inappropriate use of animals, and No. 2, promote more humane uses of animals. I think it allows researchers' concerns to be addressed and allows us to move ahead in protecting animals. I think it is a bill that the committee would agree strikes a balance between the different legitimate concerns.

One of the things that focused my attention on this issue was a segment my daughter had seen on a Sunday morning television show—where supposedly higher life forms came to Earth, put us in the cages, and used us for the experimentation. I think there is a test of civilization, that can be applied to what we do to supposedly lower life forms. When scientists can find ways to deal with this, I commend you for coming forward and saying "we, too, can deal with it," rather than not walking out there and taking all the slings and arrows that are sure to come from a lot of sides. I think that the bill strikes a good balance and, as I say, I brought Bob Welborn with me to prove that I didn't write it myself, the scientists did. That is why I feel a little more comfortable in bragging about the good balance that it has.

I also commend my colleague, Robert Roe, for being here with his bill. Thank you.

[The prepared statement of Mrs. Schroeder follows:]

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Congress of the United States
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STATEMENT OF CONGRESSWOMAN PATRICIA SCHROEDER, (D-COLO),
BEFORE THE HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
OCTOBER 13, 1981

Mr. Chairman and members of the committee, I want to thank you for the opportunity to testify on this issue.

Before I get into my testimony, I would like to invite the members of the committee, their staffs, and anyone else who may be interested, to a screening of a five minute tape developed by the Fund for Animals on the subject of animals in research experiments. The tape will be available for viewing at the House Recording Studio, room number B-310 in the Rayburn Bldg., today, at at 2:30 PM. I must caution those who would attend that the tape is extrealy explicit and is by no means pleasant to watch.

I am pleased that the committee has decided to hold hearings on the issue of the use of animals in research and testing. While I agree that it is important to search for alternatives to the use of animals, the legislation that I have introduced, H.R. 4406, does not attempt to lead us toward that goal. My bill, does not infringe on the freedoms of researchers. Instead, it seeks to reduce the subjection of animals to unecessary pain, as determined by the researchers themselves.

The bill was initially drafted by four attorneys, a practicing veterinarian, a laboratory animal veterinarian, a research veterinary surgeon, and a teacher of ethics to veterinary, medical, and post-graduate bioscience students in other words, experts in the field of lab animal research. These professionals are well aware of the balance that should and can be struck between academic freedom and animal welfare.

H.R. 4406 is based on the National Institutes of Health Guidelines and the Department of Agriculture Animal and Plant Health Inspection Service regulations. Dr. David H. Neil, the Director of Animal Care at Colorado State University, and member of the group that drafted the initial bill, commented on the bill's evolution:

> "The emphasis this time, however, was not to be on inspection, detection, and punishment, but rather on prevention of possible problems by a sound and auditable system of in-house peer review and control. Not only was this considered to be a more effective approach, but it obviated, the need for increases in government personnel. This made the proposed legislation unusual, for it established mandatory self-regulation at the institutional level, clearly placing the onus where it belonged."

Dr. Neil says it well. The bill recognizes the legitimate concerns of researchers as well as those of the animal welfare community. I believe that most researchers acknowledge a need to protect lab animals from unecessary pain and suffering.

H.R. 4406 allows that concern to be manifested in a system of oversight and prevention whereby researchers themselves will be responsible for the welfare of the laboratory animals.

Allow me to summarize the bill's four major points:

First, it mandates the establishment of an animal care committee of five members within each research facility. This is by no means a new idea. The National Institute of Health Guidelines currently require such a committee to be established in each facility to oversee procedures.

Second, it provides for a working definition of "pain" and provides that research animals be properly anesthetized to pain unless, (1) the pain is a result of a routine procedure defined in the bill, or (2) the animal care committee certifies that such anesthetization would interfere with the experiment.

Third, it expands the number of animals that would be protected under the law to include all vertebrates including rats and mice but excepting horses and farm animals.

Fourth, it eliminates the discretion of the Secretary of Agriculture to exempt certain research facilities and teaching institutions from the law.

I believe this bill is of special interest to the committee as it responds to the expressed desire to examine, and conceivably, to act to discover, paths to, (1) reducing the inapproporiate use of animals, (2) promoting more humane users of animals, (3) including the concerns of researchers in addressing animal welfare problems, and (4) acknowledging areas in which animal-based research or testing remains crucial to protection of enhancement of human health.

We can move forward to reduce the pain and suffering of animals. The legitimate concerns of researchers can be made a part of the solution. In short, I think H.R. 4406 can bring all sides together to solve a problem that all sides recognize.

Mr. **WALGREN**. Thank you very much.

I want to welcome you, Mr. Welborn, to the committee. We appreciate the kind of support that has been given Members of Congress on the merits of this issue, because if we are to come up with something that can be legislated, it has to be very, very carefully drawn and it needs people with the kind of experience that you have given Mrs. Schroeder in back of it.

It seems to me that the two bills are really part and parcel of the same picture. To the degree that we develop alternatives, we by definition make certain suffering unnecessary. So it seems to me that if we are to have a comprehensive approach, it would include elements of the foci of both pieces of legislation.

I am struck by the fact that Mr. Roe is the ranking member on the Democratic side of the aisle of the Science and Technology Committee. I hope that would communicate that this is not an antiscience effort at all. And I so much appreciate the detail in your testimony which any scientists, if they read and considered it—and I am sure that those who are leading the opinion in the community do—realize this is not something that is designed to tie their hands but, rather, something that will lead to more sensitive and constructive progress in science.

I would like to give the other members of the committee a chance to welcome you or give any opening comments they might like to have. Mr. McCurdy?

Mr. **McCURDY**. Mr. Chairman, I don't have any opening comments. I don't know if it is in order to ask a couple of questions now.

Mr. **WALGREN**. Go right ahead.

Mr. **McCURDY**. Mrs. Schroeder, of course I commend you and Mr. Roe both for your interest and work in this area. I was reading your statement and was interested in a couple of points in your summarization of the four major points of the bill. In reviewing that, it raised a couple of questions.

First of all, you would like to have peer review of at least five members within each research facility, and you go down and list some more details there. You also state eliminating the discretion of the Secretary of Agriculture to exempt certain research facilities and teaching institutions from the law.

First of all, it would appear to me that perhaps the larger institutions and those centers that do research might already have the type of safeguards that you would be considering.

What about the smaller, individual researchers? What if there are not five researchers involved in a facility? How are you going to have a peer review committee? What about the smaller centers and perhaps individuals doing this type of research? What kind of review do you have there, and what type of disciplinary action or oversight could there be?

Mrs. **Schroeder**. Well, you're right, No. 1, most of the larger facilities have some form of oversight required by the NIH guidelines. That is why I say this is not a radical proposal. The bill merely expands and codifies the guidelines.

Now, I am not aware of any research facilities where there wouldn't be at least five researchers. There may be some, and in that case I'm sure we're not going to make them go out and hire two more.

We want uniform care of animals by all researchers. We don't want to create loopholes.

You're a parent, I'm a parent, and we teach our children not to go around and mutilate animals. If they read that people are doing it in the name of science, then our children receive a confusing message. When scientists tell us that, for the most part, animals do not have to be subjected to pain, I think we have an obligation to do something about it. That is what we are trying to do. Most scientists feel very strongly about this and don't want to be tainted by the inhumane actions of others. We think all research facilities could comply with the provisions of the bill and that it isn't necessary for the big, bad Government to come around and beat them up.

Mr. **McCurdy**. Well, I think my question is really that of just a very practical nature, and that is perhaps your target. If you're saying, that it appears it is easier to target the larger facilities and institutions——

Mrs. **Schroeder**. Oh, sure.

Mr. **McCurdy** [continuing]. And generally, it would appear they would be less likely to be involved in any inhumane treatment.

Mr. **Roe**. That may not necessarily be so.

Mr. **McCurdy**. The question is, Are we having the small individuals fall through the cracks and they are the ones who may be the biggest part of the problem?

Mrs. **Schroeder**. I think my colleague——

Mr. **Roe**. If the gentlelady will yield, that is not necessarily so. I think what has happened to us in the country, like so many other things, we just take things for granted. We did it this way for the last 50 years and why shouldn't we continue to do it that way now. So the assumption that there may be better treatment—and I am not knocking anybody—in a large university could be just an assumption.

The problem is, the Nation doesn't really know the extensiveness of the entire field that we are speaking to. We need an inventory of what is happening throughout the Nation in this area. There's an enormous duplication. I think there is some $4 billion expended on this kind of research alone. So if we don't have to duplicate and the whole bit, we have got to get the Nation aware.

I think what is exciting about your hearings is that finally not only the Revlon Co. but many others including universities are already saying, "Hey, we don't have to kill all these little fellows along the line to prove a point and we want to look for new directions."

Mrs. **Schroeder**. You know, one of the things that I understand can happen in some of even the larger institutions is you have someone who has been there forever and has become kind of an institution——

Mr. **Roe**. To themselves.

Mrs. **Schroeder**. Yes. And they have their own way of doing things. In situtations like this it may be very difficult for others to speak up. We talk about how we're all equal peers, but we know that even in the House, if you're the chairman of a certain committee, there's a little more equality than some of the rest of us have. My bill provides a means of curtailing abuses that arise out of "this is the way it was always done," arguments.

Mr. **McCurdy**. You mentioned, for instance, in different testimony the use of computers and new research techniques, and again cost would appear to be a real factor. Again, it would appear that the large centers, the large facilities, teaching facilities, whatever they might be, would be better equipped to move in that direction. Again, the individual researcher, the smaller center who wouldn't have the resources available, may be resorting to that.

It may be a practical question. Is it more cost effective for the individual to use animals as opposed to moving in this direction?

Mr. **Roe**. If the gentleman would yield, I think once a lot of the basic data, as we know from our own committee work, is placed in computers, certain basic assumptions can be made by initial testing. Then you plug it back into your computer. It could be regional computers, computers locked in all over the Nation. If something is being done at Harvard, it ought to be known someplace else. If it is being done in California, it ought to be known down in Texas.

It seems to me that one of the exciting opportunities that we have here is to concentrate that information so it is retrievable all over the Nation, all over the world for that matter, so we could save an enormous amount of time and waiting for maturation of tests to take place and so forth.

Mr. **McCurdy**. Good. Well, I am just concerned about the implementation all the way down through the spectrum. I think that is a legitimate concern.

Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you, Mr. McCurdy.

Mr. Brown?

Mr. **Brown**. Thank you, Mr. Chairman.

I have an opening statement which I would like to request permission to insert in the record right after other opening statements.

To my colleagues I would like to pose this kind of a general question just for your comment. Obviously, we can make progress with regard to setting restrictions on the use of live animals in research where we can prove that it is more effective to use alternative methods, or more economical to use alternative methods. When we are confronted with the situation where we can't make that proof, and we rely upon criteria of whether it is moral or immoral, we have a much more difficult problem.

I would like to ask you to evaluate the degree to which you feel the American public would support a course of action that would enforce stringent regulations on the use of live animals at the present time. In other words, as a political problem, where do we stand right now?

Mr. ROE. Well, let me wander into that morass.

I think what we are trying to do here, and what your committee is doing, is taking the emotion out of the issue. What we are really looking for here is solid facts, what really happens. I think the American people are willing to accept the point of view that for the betterment of mankind, and for animals to that degree, too, a certain amount of experimentation is necessary and animals are essential to that. What we are simply coming back here and saying is that we have cleaned our house and that as a nation, as the citizens of a nation, we are doing the right thing by other creatures. I don't think the two are mutually exclusive at all, nor do I or Mrs. Schroeder intend to express that in our review.

But I do think the time is overdue for us to take an overview and an overlook at the whole situation, how can we improve it, how can we make it better.

Mr. BROWN. I thoroughly concur with that, and I want the committee to take the leadership in that. But what if the committee brings forth the product to the floor of the House—you know and I know it will be bitterly fought by those who say there is no such thing as morality with regard to the treatment of animals as long as we can show that it produces one iota of benefit for human beings.

Mr. ROE. There were two magnificent dogs that dispel that situation politically. One was called Fala in the Roosevelt administration, and the other one was Checkers in the Nixon administration. I think that the human approach to other creatures is enormous in this Nation, and all they want to do is see fair play. If there is fair play and reasonableness, our people will respond, I think.

Mrs. SCHROEDER. If the gentleman will yield further, I want to reemphasize that we took that carefully into account as we drafted this bill, where we are saying, "Look, let the researchers get involved." We are not proposing to create a gigantic department and send out an army of Government agents. Responsible researchers want the opportunity to care for their animals. My bill puts the authority of law behind their actions.

The other side is, will the American people accept it. I remember another set of dogs that people got terribly riled up about and that was when the Pentagon was doing all the experimentation on beagles. I don't think we ever saw so much mail in our entire lives that came into this body when that was going on.

I think the American people have all been raised to treat animals humanely and they find it unconscionable to hear that putting on a white coat allows you to do otherwise. They don't understand that. Research and the humane treatment of animals are not mutually exclusive, and all the scientists I have ever talked to agree. I think it is our job to say they are not mutually exclusive, that you can do experimentation and not abuse and mutilate the animals. I think public accepts that, and also agrees that you don't have to create a whole new bureaucracy to achieve both goals.

Mr. BROWN. Thank you.

Mr. WALGREN. Thank you, Mr. Brown.

Mr. Skeen?

Mr. SKEEN. Thank you, Mr. Chairman.

Congressman Roe mentioned just a moment ago that what we are primarily interested in is facts in regard to this, and I certainly concur.

How many of these NIH-funded installations are there in the United States using animals?

Mr. ROE. I haven't the slightest idea.

Mr. SKEEN. Where could we find out that information?

Mr. ROE. I am sure it will be available to the committee.

Mr. WALGREN. There will be witnesses from NIH later this morning and I believe they would be able to shed some light on that.

Mr. SKEEN. Let's just take this lab in Maryland, for instance. Who had the oversight, or who had the responsibility, for the inspections and so forth for this particular installation?

Mr. ROE. In asking me directly, Mr. Skeen, I think it would be inappropriate for me to respond because, again, I really don't have those total facts. I know that you do have witnesses this morning.

I, of course, read the news reports that I'm sure you have read, which were repulsive to all of us. Again, I would be prejudging that emotionally if I just responded to you on the basis of what the news articles said. In fact, I would like to hear the response, too.

I think that when we looked at the photographs that appeared in the Post and other newspapers thoughout this Nation, they were extraordinary. Somebody ought to have an awfully good answer for that someplace along the line. That is what I think you're trying to bring out this morning.

Mr. SKEEN. I have no idea of the scope of this problem, but I think these are facts that are essential to this kind of determination.

I do appreciate your testimony, and I do appreciate your bringing this kind of legislation before us in these hearings.

Thank you, Mr. Chairman.

Mr. WALGREN. Thank you, Mr. Skeen.

On behalf of the committee, thank you very much for what you have done in this area. We look forward to working with you in the process.

Mr. ROE. Thank you, Mr. Chairman.

Mrs. SCHROEDER. Thank you.

Mr. WALGREN. There are several other Members of Congress who have asked to appear, or present statements. I should like to insert in the record at this point statements by those who are unable to appear in person. These include Representatives William Whitehurst, Brian Donnelly, Ted Weiss, Harold Hollenbeck, Bill Green, Toby Moffett, and Andy Jacobs. I understand Representatives Fred Richmond and Tom Lantos will appear later in our hearings.

STATEMENT OF THE HONORABLE G. WILLIAM WHITEHURST
COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
OCTOBER 13, 1981

Mr. Chairman and members of the subcommittee:

Thank you for this opportunity to testify today before your subcommittee on the extremely sensitive issue of the use of animals in medical research and testing. The humane treatment of animals has long been a subject close to my heart, and I devoted considerable time and energy in winning passage in 1970 of the Animal Welfare and Horse Protection Acts.

Much progress has been made in recent years in the area of animal welfare; however, it is clear that additional safeguards are necessary to insure the continued humane treatment of animals and to end practices of abuse.

As I have for several years, I have introduced a concurrent resolution, H. Con. Res. 38, pertaining to the methods used on animals in research. I believe this resolution is a necessary first step toward ending the kinds of abuse which concern all of us--and at minimal expense to the government.

My resolution asks that it be the sense of the Congress that the federal government take appropriate steps to develop new research methods for its research projects, where feasible to complement or eliminate current methods involving the direct or indirect use of animals; and that no federal funds should be provided for research projects involving the direct or indirect use of animals if other methods, such as but not limited to computers, tissue culture, radionuclide techniques, chromotography, spectometry, nonanimal models, lower organisms, or dummies, can be successfully substituted.

As all of us know, there is a continuing conflict over the needs of the biomedical research community for test data, and the concern of some humane societies about the use of many species of animals for collecting these experimental data. The recent events of the medical laboratory in Maryland should serve as a reminder to us all of something Charles Darwin observed many years ago. Darwin's words ring as true today as they did then, when he noted: "Physiological experiment on animals is justifiable for real investigation, but not for mere damnable and detestable curiosity."

Mr. Chairman and members of the subcommittee, I commend all of you for convening these hearings. Your task is not an easy one; for in medical research it is not always easy to determine at the edge of a scapel which is the "dumb animal."

Thank you.

STATEMENT OF U.S. REP. BRIAN DONNELLY
SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
October 13, 1981 STATEMENT FOR RECORD

Mr. Chairman, I commend the subcommittee for undertaking this investigation of the use and misuse of live animals in scientific research.

65 million animals die in the name of scientific research annually in the United States. That is a slaughter of incredible dimensions. Tens of millions of those animals suffer intense and prolonged agony while being subjected to unnecessary or duplicative experimentation. For others, their deaths may be necessary, but are unnecessarily painful.

The legislation I have introduced, the Humane Methods of Research Act, H.R.2110, will promote research to minimize the use of live animals in the laboratory, and to minimize the pain and suffering of animals that are required for research. The Research Modernization Act, H.R.556, which I have cosponsored, establishes a reasonable policy for eliminating unnecessary use of live animals in tests and research conducted by the federal government.

The scientific community has no reason to fear either of these bills. Legitimate and vital scientific research must and will continue in order to improve the quality of human life. The legislation before this subcommittee is designed to guarantee that the quest for an improved quality of human life is carried out with appropriate respect for the quality of all life.

TESTIMONY OF
REPRESENTATIVE TED WEISS

BEFORE THE
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY

OCTOBER 14, 1981

I AM PLEASED TO HAVE THIS OPPORTUNITY TO CONTRIBUTE TO HEARINGS ON THE USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING. I WOULD LIKE TO EXPRESS MY GRATITUDE TO THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY FOR CONVENING THESE HEARINGS AND MAKING IT POSSIBLE FOR THE ADVOCATES OF ANIMAL WELFARE AND MEMBERS OF THE SCIENTIFIC COMMUNITY TO ENGAGE IN A PUBLIC DIALOGUE FOCUSSED ON DEVELOPING A SOLUTION WHICH WILL SATISFY RESEARCH OBJECTIVES WITHOUT PROMOTING UNNECESSARY PAIN AND SUFFERING OF ANIMALS.

EACH YEAR, AN ESTIMATED 65 MILLION ANIMALS ARE SACRIFICED FOR THE SAKE OF SCIENTIFIC RESEARCH IN THIS COUNTRY. MANY OF THESE ANIMALS SUFFER NEEDLESS CRUELTY AND SUFFERING IN LABORATORIES BECAUSE RESEARCHERS ARE OFTEN NOT AWARE OF, OR DO NOT HAVE ACCESS TO, ALTERNATIVE METHODS TO THE USE OF LIVE ANIMALS IN THEIR WORK. MOREOVER, MANY ANIMALS ARE SENSELESSLY SUBJECTED TO PROTRACTED PAIN DURING DUPLICATIVE AND UNNECESSARY EXPERIMENTS.

UNTIL RECENTLY THE MAJORITY OF THE PUBLIC HAS BEEN SPARED THE AGONIZING SAGA OF ABUSES INFLICTED UPON ANIMALS IN MANY LABORATORIES. THE EXPOSE OF THE MARYLAND MEDICAL RESEARCH CENTER'S TREATMENT OF MONKEYS SHOCKED AND HORRIFIED AMERICANS AS THE HELLISH TALE UNRAVELED IN THE NATION'S NEWSPAPERS. HOPEFULLY, BECAUSE OF GROWING PUBLIC CONCERN, THESE INNOCENT VICTIMS WILL BE SPARED FURTHER HARM THROUGH ENFORCEMENT OF STATE ANIMAL CRUELTY LAWS.

UNFORTUNATELY, THE MARYLAND STORY IS ONLY THE TIP OF THE ICEBERG OF MISTREATMENT OF ANIMALS IN SCIENTIFIC ENDEAVORS. HIDDEN BEHIND IMAGES OF HUMANE TREATMENT OFTEN ARE CRUEL TESTS WHICH INCLUDE ELECTRIC SHOCK, BURNING, RADIATION, STARVATION, AND EXPOSURE TO ACUTE TOXICITY. THE HIGHLY PUBLICIZED DRAIZE EYE TEST AND LD/50 TEST EXEMPLIFY THE TRAGEDY OF REPEATEDLY EXPOSING DEFENSELESS ANIMALS TO CAUSTIC CHEMICALS DURING EXPERIMENTATION.

THE PROBLEMS ASSOCIATED WITH USING LIVE ANIMALS IN RESEARCH LABS GO BEYOND THE FREQUENT MISTREATMENT OF THE SUBJECT. MANY SCIENTISTS HAVE COME TO RECOGNIZE THAT ANIMALS ARE OFTEN NOT THE BEST RESEARCH VEHICLES, PARTICULARLY IN LIGHT OF THE DEVELOPMENT OF NEW, MORE PRECISE EXPERIMENTAL METHODS.

IN FACT, MANY EXPERIMENTS REVEAL THAT TESTS USING ANIMALS ARE OFTEN UNRELIABLE AND YIELD INCONCLUSIVE RESULTS. THIS WAS FOUND TO BE THE CASE IN A STUDY CONDUCTED ON THE DRAIZE RABBIT EYE TEST. LAB INDUCED STRESS AND FEAR IN ANIMALS OFTEN RESULTS IN CONFUSED AND INCONSISTENT DATA. MOREOVER, MANY TESTS FAIL TO ESTABLISH DEFINITIVE PARALLELS

BETWEEN HUMANS AND ANIMALS. A CASE IN POINT IS THE INVESTIGATION INTO THE SAFETY OF THALIDOMIDE, A DRUG WHICH TURNED OUT TO BE DEVASTATING TO HUMANS, DESPITE ITS HARMLESS EFFECTS ON LABORATORY ANIMALS. OTHER DRAWBACKS IN EXPERIMENTING WITH ANIMALS INVOLVE HIGH COSTS, SCARCE VETERINARY SKILLS, AND VAST EXPENDITURES OF TIME AND ENERGY REQUIRED ON THE PART OF RESEARCH FACILITIES.

THE SUFFERING OF ANIMALS IN RESEARCH LABS CERTAINLY OFFERS COMPELLING REASONS FOR CURTAILING THEIR USE IN SCIENTIFIC EXPERIMENTS. HOWEVER, WE CANNOT UNEQUIVOCALLY DISREGARD, AS THE MEDICAL COMMUNITY POINTS OUT, THE IMPORTANCE OF ANIMAL SUBJECTS IN THE PURSUIT OF BIO-MEDICAL RESEARCH. ANIMALS HAVE BEEN UTILIZED FOR HUNDREDS OF YEARS IN SUCCESSFUL EFFORTS TO FIND CURES FOR AND IDENTIFY CAUSES IN HUMAN ILLNESS AND DEFECTS. IN ALL LIKELIHOOD, THERE WILL CONTINUE TO BE A CRITICAL NEED FOR ANIMAL SUBJECTS IN CERTAIN KINDS OF MEDICAL EXPERIMENTATION. FOR THOSE ANIMALS, THE MOST HUMANE CONDITIONS MUST BE PROVIDED BOTH PRIOR, DURING AND AFTER THE EXPERIMENT. BUT IN ALL OTHER INSTANCES, THE HARSH REALITY OF ANIMAL SUFFERING SHOULD MOTIVATE A COMPASSIONATE SOCIETY TO ACTIVELY USE AND SEEK ALTERNATIVE METHODS OF RESEARCH.

PRESENTLY, THERE ARE SEVERAL RESEARCH METHODS WHICH CAN EFFECTIVELY REPLACE THE USE OF LIVE ANIMALS IN CERTAIN TESTING PROCEDURES. ONE SUCH METHOD IS THAT OF GROWING ARTIFICIAL BRAIN TUMOR CELLS IN A TISSUE CULTURE. THE BRAIN TUMOR CELLS PRODUCE A SUBSTANCE WHICH ALLOWS

RESEARCHERS TO DIAGNOSE BRAIN CANCER FROM BLOOD TESTS. ANOTHER METHOD INVOLVES USING SKIN FROM HUMAN VOLUNTEER'S WHICH CAN BE PLACED IN SOLUTION TO ANALYZE THE EFFECT OF POISON, RATHER THAN SUBJECTING ANIMALS TO RESEARCH WHICH TESTS THE PENETRABILITY OF POISON THROUGH THE SKIN. MATHEMATICAL MODELING IS ANOTHER AVAILABLE ALTERNATIVE TO THE USE OF LIVE ANIMALS IN CERTAIN EXPERIMENTS. COMPUTERS CAN BE USED TO STORE INFORMATION ABOUT KNOWN CANCER-CAUSING AGENTS AND DETECT THE LIKELIHOOD OF OTHER CHEMICALS CONTAINING CANCER-CAUSING AGENTS. THE USE OF QUANTUM CHEMICAL ANALYSIS CAN ALSO BE USED FOR DETECTING WHETHER A CHEMICAL IS LIKELY TO CAUSE CANCER. BY MATHEMATICALLY CONSTRUCTING A BLUE-PRINT OF A MOLECULE UNDER STUDY, RESEARCHERS CAN COMPARE THIS MOLECULAR BLUE-PRINT TO THE MOLECULAR STRUCTURE OF KNOWN CARCINOGENS.

EVEN THOUGH SOME OF THESE METHODS OF RESEARCH MAY NOT PROVIDE ALL OF THE INFORMATION NECESSARY TO DETERMINE THE EFFECTIVENESS AND SAFETY OF CERTAIN CHEMICALS ON PEOPLE AND THE ENVIRONMENT, THESE RESEARCH PROCEDURES HELP SET PRIORITIES FOR DECIDING WHICH SUBSTANCES REQUIRE FURTHER TESTING. IN EXPERIMENTS WHERE IT IS DEEMED ABSOLUTELY NECESSARY TO USE ANIMALS, SOME OF THE ABOVE-MENTIONED RESEARCH METHODS WOULD BE USEFUL FOR AVOIDING UNNECESSARY DUPLICATION OF THESE EXPERIMENTS.

AS STATED PREVIOUSLY, ANIMALS HAVE BEEN THE SUBJECT OF INHUMANE RESEARCH METHODS, UNNECESSARY DUPLICATION OF EXPERIMENTS, AND HAVE

SUFFERED IN LABORATORY RESEARCH AND TESTING. ALTERNATIVE METHODS OF RESEARCH NEED TO BE FULLY INVESTIGATED IN ORDER TO MAINTAIN THE EFFECTIVENESS OF LABORATORY RESEARCH WITHOUT PERPETRATING THE USE OF ANIMALS WHEN IT IS NOT REQUIRED.

THERE ARE SEVERAL LEGISLATIVE PROPOSALS, NOW PENDING, WHICH ARE DESIGNED TO PROTECT ANIMALS IN RESEARCH. ALTHOUGH NO ONE PIECE OF LEGISLATION CAN RESOLVE THIS COMPLEX ISSUE, I BELIEVE THAT THE BILL I HAVE INTRODUCED PROVIDES A FRAMEWORK FOR EXAMINING AND ADDRESSING THIS PROBLEM. MY BILL, H.R. 930, THE PROTECTION OF ANIMALS IN RESEARCH ACT, WOULD ESTABLISH A COMMISSION TO STUDY AND RECOMMEND ALTERNATIVES TO CURRENT RESEARCH PROCEDURES WHICH UTILIZE LIVE ANIMALS. THE COMMISSION WOULD INVESTIGATE WAYS TO PREVENT THE DUPLICATION OF TESTS THAT USE LIVE ANIMALS. INHERENT IN THESE RESPONSIBILITIES WOULD BE THE COMMISSION'S DUTIES TO INVESTIGATE AND EVALUATE THE AVAILABILITY OF ADEQUATE SUBSTITUTES TO LIVE ANIMALS IN LABORATORY RESEARCH.

I AM ALSO COSPONSORING SEVERAL OTHER PROPOSALS DESIGNED TO PROTECT ANIMALS FROM CRUEL AND UNNECESSARY EXPERIMENTATION. H.CON.RES. 27 WOULD REQUIRE ANY FEDERAL AGENCY UTILIZING THE DRAIZE RABBIT EYE IRRITANCY TEST TO DEVELOP AN ALTERNATIVE TESTING PROCEDURE WHICH WILL NOT REQUIRE THE USE OF ANIMALS. H.R. 220 AND H.R. 2110, IDENTICAL BILLS REFERRED TO AS THE HUMANE METHODS OF RESEARCH ACT, PROMOTE THE DEVELOPMENT OF METHODS OF RESEARCH, EXPERIMENTATION AND TESTING THAT MINIMIZE THE USE OF LIVE ANIMALS. I BELIEVE THAT THESE PROPOSALS WOULD

SUCCESSFULLY SUPPLEMENT EACH OTHER IN ACHIEVING THEIR COMMON GOAL OF PROTECTING ANIMALS FROM THE PAIN AND SUFFERING OF RESEARCH EXPERIMENTATION.

THESE HEARINGS REFLECT A RECOGNITION OF THE INCREASING PUBLIC CONCERN ABOUT THE USE OF ANIMALS IN LABORATORIES. CLEARLY, THE ISSUE IS ONE OF GREAT COMPLEXITY; IT INVOLVES QUESTIONS OF SCIENCTIFIC AND ETHICAL RESPONSIBILITY TO THE WELFARE AND HEALTH OF BOTH ANIMAL SUBJECTS AND HUMAN BENEFICIARIES. IT IS MY HOPE THAT THIS PUBLIC EXAMINATION OF THE ISSUE WILL ASSIST THIS COMMITTEE IN ITS CONSIDERATION OF PENDING PROPOSALS AS WELL AS LEAD TO PROMPT PASSAGE OF LEGISLATION TO PROTECT ANIMALS BY CONGRESS.

Harold C. Hollenbeck

STATEMENT FOR ANIMAL HEARINGS--SCIENCE AND TECHNOLOGY

Mr. Chairman, as one of the original co-sponsors of H.R. 556, The Research Modernization Act, I would like to take this opportunity to commend the subcommittee for their decision to hold hearings on this controversial subject. I believe the subcommittee should gather and hear a variety of viewpoints pertaining to alternative research and testing methods that do not use live animals. I hope that genuine progress will be made in eliminating some of the unnecessary, uneconomic, and inappropriate uses of animals in medical and scientific laboratories. I, like many of my colleagues participating in today's hearings, do not support research endeavors which needlessly torture helpless animals.

Scientists in the federal research establishment have found that traditional methods of research which utilize animals are sometimes inadequate in the monitoring of the hundreds of new substances entering our environment each year. I am optimistic that the successful development of alternatives to animal testing will be faster, more economical and have a greater degree of reliability in the testing of toxic substances, food additives, and chemicals.

Because the use of animals in research has also produced substantial positive results in combatting diabetes, polio, measles, and numerous infections through the treatment of antibiotics, I believe that when animal experimentation is necessary every effort should be made to minimize the suffering of the animals involved.

During the past few years, I have closely followed the debate concerning animal based research. I am pleased that the subcommittee has taken the initiative and finally granted an appropriate forum in which all perspectives of this complicated question can be adequately addressed.

TESTIMONY OF
REPRESENTATIVE BILL GREEN
BEFORE THE
SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
OCTOBER 13, 1981

Mr. Chairman, thank you for allowing me to come before you today. I would like to commend the Subcommittee for arranging these two days of hearings on an issue that has been of great concern to Congress and the public for many years--animal welfare.

Animal welfare is an issue we must not neglect. This issue has concerned me since I came to the Congress in 1978, and in this Congress, as in the last, I have cosponsored H.R. 220, the Humane Methods of Research Act. Many basic considerations are at the heart of the animal welfare issue: medical and humane values, budgetary considerations, the need to test the effects of chemical substances that have entered our environment at an increasing rate, and the need to conserve and respect the lives of innocent animals. These hearings are a very useful forum in which to focus and frame these issues, and I am very pleased to have the opportunity to participate in these first steps toward formulating a workable solution to the concerns of both the animal welfare and medical communities.

I would like to focus on which I believe to be the proper role of Congress in the area of research methods. First, I think tightening existing inspection activities and procedures would be extremely useful. For example, the Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) requires that a research facility file annual reports of the types and numbers of animals used in research and the number of animals that suffer pain in the course of research, but it has no means of validating the reports it receives. Hence, AHPIS' regulations are almost useless. Also, the National Institute of Health (NIH) has an enforceable set of standards for laboratory animal care called the "Guide for the Care and Use of Laboratory Animals," and which is embodied in its statement of Principals for the Use of Animals. However, in the recent case of the monkeys that were removed from a behavioral research laboratory in Maryland, those standards were not enforced. Only after the terrible conditions at the lab were exposed and a court suit was filed was the grant under which these very painful and stressful experiments were performed terminated. If these standards had been enforced in a timely manner, the animals there would not have suffered unnecessary agony.

I also believe the NIH could strengthen its role in discussion and dissemination of alternative methods. The NIH has already taken steps in this direction and these efforts are very commendable. I have read many favorable reports of the NIH conference held this February to discuss several methods of bioassay, including in vitro methods (which employ tissue and cell cultures), in vivo methods (which require live animals), and mathematical and computer models. Collaborative efforts where a broad spectrum of interested parties are involved are exceedingly helpful in our efforts to reduce unnecessary animal suffering and to gain knowledge of and familiarity with efficient and reliable alternative methods. This type of useful exchange will aid Congress and the public in making intelligent decisions on scientific practices involving animals and the NIH should be encouraged in this area.

Another area where action is needed is regulatory reform. Frequently, due to conflicting standards for toxicity testing among various federal agencies, duplicative testing must be conducted. Such regulatory overlap wastes both government money and precious animal lives. Already a group called the Interagency Regulatory Liaison Group (IRLG) has worked for four years to eliminate regulatory testing overlap among the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), the Consumer Product Safety Commission, and the Occupational Health and Safety Administration (OSHA). Eliminating unnecessary bureaucratic red tape is an arduous process but it must be done wherever possible to conserve animal lives. The Subcommittee could consider bringing this aspect of regulatory burdens to the attention of the Task Force on Regulatory Relief headed by Vice President Bush, and Congress must strengthen its oversight role in this area.

Since joining the Appropriations Subcommittee on HUD and Independent Agencies as Ranking Minority Member this year, I have gained a good appreciation of the programs of the National Science Foundation (NSF). One area that I believe has great potential for eliminating animal suffering is the use of NSF science education grants to increase students' awareness of the techniques for alternative methods. As these grants are often aimed at younger people, increasing grants to programs that stress alternative or non-live-animal experiments will provide to students an understanding of alternative methods that they can build upon during their careers. Instilling in students a respect for animal lives and a working knowledge of alternative methods will, I feel, much improve the "state of the art" in this relatively uncharted area.

These are but a few of the means by which Congress might play a useful role in promoting commpassionate and reasonable use of animals in the laboratory, and useful scientific inquiry. As I said earlier, these hearings provide an invaluable forum in which to discuss the needs of animals and the proper means of science, and I thank you for allowing me to come before you today.

STATEMENT OF CONGRESSMAN TOBY MOFFETT ON H.R. 566, THE RESEARCH MODERNIZATION ACT BEFORE THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY OF THE COMMITTEE ON SCIENCE AND TECHNOLOGY

Chairman Walgren and Members of the Subcommittee, I am grateful for this opportunity to express to the Subcommittee my thoughts on H.R. 556, the Research Modernization Act.

Beyond the arguments detailing the inhumane nature of many laboratory tests using live animals, I would like to add my own concerns that such research is often unnecessary and less effective than methods which do not use live animals. As has been pointed out by many witnesses who have participated in these hearings, there exist feasible, more effective alternatives to many tests requiring live animals. The Draize tests, for example, require the use of live rabbits for determining whether or not a product may cause eye irritation. It has been argued that cell cultures and tissue samples could provide results which are equally reliable or more reliable and accurate than these painful tests. Such alternatives should be pursued wherever possible.

I am also concerned about widespread duplication of tests involving the use of live animals. Such duplication is both inhumane and wasteful. I am hopeful that the government can take a positive role in helping to coordinate research efforts, and thus eliminate unnecessary testing.

In closing, I would like to share with the Subcommittee comments I have received from my constituents on this issue:

> "Every day is another day of needless suffering for the helpless animals used in experiments." Mrs. Ethel Black, Andover, Connecticut

> "I am opposed to painful and in my opinion unnecessary experimentation on animals. . . . There is a serious need for alternative research methods." Ms. Linda Biancalani, West Hartford, Connecticut

> "I detest the thought that my tax money, as well as that of many other concerned citizens, contributes to this research, when alternatives are available or are in the process of being developed." Ms. Gloria Deske, East Hartford, Connecticut

I would again like to thank the Members of the Subcommittee for this opportunity to testify. I am pleased that you are taking an active role in seeking to modernize laboratory testing methods to make them more humane and more effective. I hope that you will act quickly to see that these goals are implemented.

U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D. C. 20515

ANDY JACOBS

December 16, 1981

Mr. Chairman, Shelley wrote:

> The great secret of morals is love. A person to be greatly good must imagine deeply and comprehensively. He must put himself in the place of another, of many others. The pleasures and pains of his species must become his own.

That was written a long time ago when even the most civilized of the world was not so civilized as one might hope.

Surely we have come to the point in civilization where the pain of other species should bother us.

Edward R. Murrow said that "The pain from the cut of a little finger would render more sensation to some people than the knowledge that their fellow humans are being cut to ribbons elsewhere in the world."

And Solons said, "Civilization is impossible until the unconcerned are as outraged as the victims."

In the case of the Draize Test, the victims are innocent animals.

Were it necessary to sacrifice life and limb of lower animals for the preservation of humans, I dare say most of us would accept such sacrifices.

But generally speaking, the Draize Test is not for the purpose of producing products for the preservation of human life. In most instances the purpose is to produce decorations for the human body.

Even an animal sacrifice for that purpose probably would be acceptable to a wide segment of our population, but only if there were no alternative tests.

The purpose of legislation before Congress, including the House Concurrent Resolution 27 which I have had the privilege to introduce, is to encourage a discovery of testing methods that can produce products of pleasure for humans without inflicting pain on lower animals. Surely that is not asking too much.

Mr. WALGREN. The next witness is Mr. Alex Pacheco. Mr. Pacheco was a volunteer at the Institute for Behavioral Research in Silver Spring, Md. He served as a research assistant at that institute and, as is widely known, was the individual responsible for calling the public's attention to what was occurring at that institute and the condition of the animals there.

Welcome to the committee, Mr. Pacheco. We understand you have some pictures that could be mounted on that easel over there.

Your written statement will be made a part of the record as a matter of course, and please feel free to proceed, either outlining or reading your statement, as you feel best in communicating to the committee.

We do have time constraints because we have a long list of witnesses this morning, so if you would just be cognizant of that and keep it in mind, we would be happy to hear your testimony. We want to thank you very much for coming to the committee this morning.

STATEMENT OF ALEX PACHECO, CHAIRPERSON, PEOPLE FOR THE ETHICAL TREATMENT OF ANIMALS, AND THE GEORGE WASHINGTON UNIVERSITY ETHICS AND ANIMALS SOCIETY

Mr. PACHECO. Thank you, Mr. Chairman.

My name is Alex Pacheco, and I am chairperson for People for the Ethical Treatment of Animals, and I also chair the George Washington University Ethics and Animals Society. First, I have a few photographs that I would like to pass around so you can visualize some of the things I will be describing.

I recently worked at a laboratory called the Institute for Behavioral Research (IBR), which is just about 25 minutes from here. At this laboratory human research and animal research was conducted. This laboratory, through Dr. Edward Taub, a psychologist, has received roughly 2¼ million NIH dollars for particular experiments involving the severing of nerves in monkeys.

These experiments, which were recently suspended by NIH, involved cutting the nerves at the spine of the monkey, thus rendering a limb useless. Then, through electric shock punishment and other forms of negative stimuli, the animals were forced to try to use their bad arms.

So far, I haven't been able to find any evidence that this research has benefited mankind, and I think the best example of this would be the fact that Dr. Taub himself has never specifically made any mention as to how he has really helped or how this research has helped mankind. I think that is the best example of how much good has really come from the many years of this experimentation.

Throughout the 4 months that I worked at the laboratory, I saw a total disregard for and a total ignorance of the psychological and the physical well-being of all the animals in the laboratory. I saw, for example, animals in the laboratory that were allowed to injure themselves, and injure each other, just because some of the most basic and simple safety precautions were not taken. No consideration was given for the safety of the animals.

As an example of this, just 4 days ago one of the experimental monkeys named Charlie died in the laboratory. He died as a result of improper caging and handling, during which he was allowed to be attacked by another male macaque in the laboratory, and through that attack he suffered some serious injuries. I believe he died needlessly in that laboratory because IBR had been warned in writing about this obvious danger that existed in the caging of the animals.

I should mention that Dr. Taub himself has estimated these particular primates to be worth somewhere between 60 and 100,000 tax dollars each.

Also, while I was at the laboratory, I saw two of the monkeys, Paul and Hard Times, collapse to their cage floors from not being fed by some of the unsupervised staff. Many of the animals would go for days at a time without being fed. Also, the date on the feed supply used by this laboratory had expired about 3 months before I began working there. I should point out that there are clear instructions on the bags indicating that it must be supplemented with vitamins after a certain date because it becomes nutritionally deficient. And even though these clear instructions were there, no supplements were ever given to the animals for the entire time I was there.

I also saw many primates with open wounds, lacerations, deformed wrists, fingerless hands, and broken bones. Much of this was due to a complete lack of attention to the treatment and even to the prevention of these types of injuries. Improper bandaging by untrained staff took place—not many wounds were bandaged, but when bandaging was done, it was done by untrained staff. And self-mutilation was undiscouraged in this laboratory.

The principle of this laboratory was that self-mutilation is just something that can't be avoided, because that's what happens. I think it is an absurd principle.

Billy, one of the gentlest of all the primates in the colony room, has lost 8 of his 10 fingers and, because of that, he has to attempt to feed himself with his feet, or by bending over and eating directly off his cage floor. These animals were never given food bowls or anything to comfort themselves in their cages. Their cages were totally barren. They were given nothing to manipulate—and these are very intelligent and very curious animals.

When I asked Dr. Taub, the chief investigator at this laboratory, why nothing was done to help accommodate some of the crippled animals—such as why Billy wasn't given a bowl to eat from—Dr. Taub said that "Billy likes to eat with his feet."

Also, because no food bowls were provided, the food would be thrown into the cage, fall through the wire cage floors and land in the excrement pans below the cages, where it would immediately begin to absorb urine. And since the monkeys were only fed, at the most, once a day, whenever you would pull an excrement pan out, the monkeys would reach down desperately to try to grab something to eat out of the excrement pan.

In the lab the primates were left for weeks and months with injuries, such as broken bones, lacerations, and draining septic wounds. No veterinarian had treated any of the animals in this laboratory for at least 2 years. In the last 10 months alone, three of the animals have died in incidents unrelated to the experimentation taking place.

I would like to say that no one needs a Ph. D. or any other credentials to recognize the blatant violations of the Animal Welfare Act that were taking place in this laboratory. No one needs a degree to recognize when an animal's cage should be cleaned, or that an animal that has just chewed off all five of his fingers, needs to be seen by a veterinarian. It is apparently also not necessary to have a degree to conduct research on primates that were paid for by NIH, because within 1 week after I first walked into this laboratory, without any inquiry into my experience or my health—and health is a serious matter when you're dealing with nonhuman primates—I was put in charge of an original research project called a "A Pilot Study on Displacement Behavior." I was given two primates from Dr. Taub's own research group of monkeys and given a separate room, given video equiptment to film everything I did. I was told to torment, agitate, and frustrate and agitate the animals, and then film their reactions.

When I asked what we hoped to get out of this experiment, I was told several times that, "It has never been done before and we might find something interesting." And "something interesting" is what was repeated to me many times. They said, "If we do come up with something interesting, we might be able to get funding for it."

I need to mention that some of the researchers would go so far as to torment the animals in their cages. They would do things such as shake the cages, make harrassing sounds at the animals, verbally threaten the animals, and at one point one experimenter thrust a pair of surgical pliers into the mouth of one of the animals and shook them violently against his teeth. The primate named Dimition, was immobilized in a restraining device at the time.

For the whole time I was there, the laboratory remained in an unchanged condition of extreme filth, disrepair, and disarray, and the whole time the animals remained neglected in their cages. None of the animals were given anything to do inside their cages for the entire 3 to 4 years that they have been there, since they were taken from the wild. They used their lame arms as cushions to provide relief from the steel wire floors that they were forced to live on, and they used their own wounds and injuries as things to manipulate, to pick at and chew on.

Their lives, in reality, consisted of only hoping for a once-a-day feeding and at other times waiting for electric shock and other negative stimuli in experimental procedures that were conducted on them.

Other conditions at the laboratory—which you can see in some of the photographs—included piles of rodent excrement on the floors, in drawers, and on shelves; dirty laundry and discarded tennis shoes in the operating room—the operating room table doubled as a desk—holes in the walls and ceilings; dried blood on the floors and on the ceiling of an experimental chamber—which was a converted refrigerator—piles of molding feces in the cages that were never cleaned. The entire 4 months I was there, these are the things that I saw, witnessed and photographed, and the things also that the Montgomery County Police photographed when they raided the laboratory.

I should mention that in responding to the NIH investigators, a member of the laboratory's animal care committee—a committee that was set up by the laboratory consisting of scientists, a veterinarian, an M.D., and other researchers—the same type that many laboratories have set up in their self-policing system—stated that he assumed IBR was acceptable by all legal and ethical standards because the USDA inspected the laboratory and because NIH had approved its funding.

If other animal care committees operate under these same assumptions, we have a serious problem on our hands. I think we should ask NIH how many, if any, of the animal care committees—which are, in effect, composed of fellow researchers appointed by the experimenters themselves—how many of these committees have ever taken independent actions to correct deficiencies or report compliance failures to NIH.

I would like to read a few sentences to you here. Of grave concern, is a statement from the IBR animal care committee that it had never considered administering pain killers to any of the animals because analgesics are not required, as far as this scientific committee was aware, by any guide or professional standard.

I think perhaps most alarming of all is the statement made to NIH by Dr. David Rioch, M.D., chairman of that animal care committee, that "applying human expectations of pain to animals is inappropriate because pain is primarily a matter of societal conditioning to which animals are not subject."

I think this indicates that clearly it is going to take legislation to bring some people in the research community into line with 20th century thought on pain in animals and the necessity for administering pain killers in the reduction of animal suffering.

I also think this incident at this laboratory has made it clear that neither the NIH peer review system, nor the USDA inspection program, works very well at all.

I should mention that in 1977 NIH was informed of the conditions at this laboratory, and at that time the laboratory was found to have been operating for 5 years without a license. Within 1 week after this violation was reported to USDA, USDA issued them a license and took no action against the filthy conditions existing at that time.

In 1977 NIH promised to investigate and remedy problems at that laboratory. Dr. Taub might well express surprise that the NIH has now, after 11 years of funding and after 11 years of inspections, finally found serious fault in his laboratory. I should mention that this laboratory, the Institute for Behavioral Research, is located less than 15 minutes from NIH headquarters and main campus in Bethesda.

I should mention also that USDA, up to this day, has not taken any action against IBR and has not even admitted that there were any problems at this laboratory other than minor deficiencies, even after Charlie died in the laboratory last Friday.

Again, in closing, I would just like to mention, as will be pointed out again and again, anywhere from 60 to 100 million animals exist and die in laboratories in our country alone every single year. I think that even if only 1 percent of the laboratories in this country are like the Institute for Behavioral Research, then we have a very serious ethical problem that has to be dealt with strongly and in a civilized fashion.

Thank you.

[The prepared statement of Mr. Pacheco follows:]

TESTIMONY OF ALEX PACHECO

MR. CHAIRMAN, MEMBERS OF THE SUBCOMMITTEE:

I am pleased to be here today at your invitation. My name is Alex Pacheco, I am chairperson for People for the Ethical Treatment of Animals and the George Washington University Ethics and Animals Society.

I recently worked at the Institute for Behavioral Research, (IBR), a laboratory located just twenty-five minutes from here, where human and animal experimentation is done. The IBR, through Dr. Edward Taub, a psychologist, received approximately 1.6 million N.I.H. dollars in the past ten years for experimentation involving the severing of nerves in monkeys. The experiments, recently suspended by the N.I.H., involve severing monkeys' nerves at the spine, initially rendering a limb useless. The animals are then forced, through electric shock punishment and other negative stimuli, to regain the use of their surgically impaired arms.

I have not been able to find any evidence that this research benefited mankind or animals, and perhaps the best indicator of that is Dr. Taub's own lack of specificity in pointing to the value of his experiments to the retarded and stroke victims, whom he claims to be helping.

Throughout the four months I was at the IBR laboratory, I witnessed a total disregard for the physical and psychological needs of the animals. For example, primates injured themselves and one another because basic, common safety precautions were ignored. (Dr. Taub has said he would have made corrections if he had only been approached. Yet, just four days ago, Charlie, one of the experimental primates, died when the laboratory, continuing to disregard warnings from primate experts, failed to protect him from an attack by another male macaque monkey. This animal, who died needlessly following surgery that was delayed until the next day, is valued by Dr. Taub at between sixty and one hundred thousand tax dollars.

While I was at the IBR, two of the monkeys, Paul and Hard Times, collapsed to their cage floors when unsupervised staff failed to feed them for several days. Also, the feed supply had passed the manufacturer's expiration date and, despite clear instructions on the bags to supplement the food, no nutritional supplements were ever provided during my tenure at the laboratory. A third monkey, named Big Boy, almost died by hanging when the seat of a jury-rigged restraining device collapsed beneath him.

While at the laboratory I saw primates with open wounds, deformed wrists, and fingerless hands - due to a complete lack of attention to the treatment and prevention of injuries that had resulted from improper bandaging by untrained staff and undiscouraged self-mutilation. This laboratory's principal that self-mutilation cannot be avoided because "that's what happens", would make it acceptable for us to allow self-destuctive, institutionalized human patients to tear themselves apart. In that context the absurdity is hard to overlook.

Billy, the gentlest of all the primates in the colony, has lost eight of his ten fingers and must, therefore, attempt to feed himself with his feet, or by bending over and eating with his mouth directly off the cage floor. His desperate efforts to prevent his food from falling into the excrement pans below his cage were also ignored. Again, Dr. Taub has pled that he would have been receptive to suggestion. Yet, when asked by the media why no compensations were made for Billy's incapacities, such as simply providing a food bowl, he stated, "Billy likes to eat with his feet." It should be noted that those animals with the use of one or more arms were able to reach through their cage floors and would thus, through hunger, retrieve and feed on the urine-soaked food that dropped into the fecal pans.

Out of the annual budget for this single project of over $115,000, the laboratory spent only ten dollars a day for a person to feed and clean, and claimed an additional fifty-five cents per day per monkey to cover feeding expenses.

In the laboratory, primates were left for weeks and months with serious injuries, broken bones, and draining, septic wounds. No veterinarian had treated any animal at the facility in at least two years. In the last ten months, three animals have died in incidents unrelated to the experiments. Dr. Taub has stated that veterinarians are not competent to treat deafferented animals. Yet, in those instances when wounds were bandaged, the bandages were applied by lay personnel, and then simply allowed to rot off, as shown in the photographs. It should be mentioned here that Dr. Taub himself is not a veterinarian, nor indeed a medical doctor.

I would also like to point out that no-one needs a PhD or any other credentials to recognize blatant violations of the Animal Welfare Act. No-one needs a degree to recognize when an animal's cage should be cleaned, or that an animal who has just chewed off all his fingers should be seen by a veterinarian. Apparently, it is also not necessary to have a degree to conduct research on animals that are paid for by the N.I.H., as demonstrated by my assignment to a new research project.

Within one week after I first walked into the laboratory, and without any enquiry as to my experience or health (a serious safety concern when dealing with non-human primates), I was put in charge of a pilot study, assigned two primates in a separate room, and told to agitate and frustrate them and film their reactions. I asked the purpose of this study and was told, "It's never been done before", "We might find something interesting", and "If we do, we may get funding for it." Other experimenters at the IBR recounted how they would pull animals out of their experiments if the animals were not giving desired results or performing tasks in the expected manner. Often, some of the researchers went so far as to torment the animals, shaking their cages, making harassing sounds, verbally threatening them, and at one point, even thrusting a pair of surgical pliers between the animal's teeth when it was immobilized in a restraining device.

Meanwhile, the laboratory remained in an unchanged condition of extreme filth, disrepair and disarray and the primates continued to be neglected in their barren cages. No occupied cage contained any bowl, resting board or item of any kind for these intelligent, curious animals to manipulate. They used their lame arms as cushions to provide relief from the steel wire floors and their own wounds and injuries as "things" to pick at and chew on. Their lives consisted, at best, of waiting for a single, daily feeding; at other times, for electric shock or other experimental procedures.

As the dates on the photographs show, conditons such as strewn trash, rodent excrement on the floors, shelves, and in drawers;dirty laundry and discarded tennis shoes in the operating room; holes in the walls and ceilings; dried blood on the floors and on the ceiling of an experimental chamber (a converted refrigerator); and piles of molding feces, remained consistent for the entire four months I was there.

In responding to the N.I.H. investigators, a member of the IBR's Animal Care Committee commented that he assumed the IBR was acceptable by all legal and ethical standards because the U.S.D.A. inspected the laboratory and because the N.I.H. approved its funding. If other Animal Care Committees operate under the same assumptions, their existence is a waste of time and money, and a complete sham. This subcommittee may wish to ask the N.I.H. how many, if any, Animal Care Committees (in effect, peer reviewers appointed by the experimenters themselves) have ever taken independent actions to correct deficiencies or report compliance failures to the N.I.H.

Of grave concern is a statement from the IBR Animal Care Committee that it had never considered administering pain killers to any of the animals because analgesics are not required, as far as the Committee is aware, by any guide or professional standard. They further stated that post-operative pain killers are "unnecessary" because primates rarely experience feeling in deafferent limbs. The site of the surgery from which pain would emanate would, in these cases, be the spine, not the deafferent limb.

Perhaps most frightening of all is the statement of Dr. David Rioch, M.D., Chairperson of the IBR's Animal Care Committee, that "applying human expectations of pain to animals is inappropriate because pain is primarily a matter of societal conditioning to which animals are not subject."

Clearly then, it will take legislation to bring certain persons in the research community in line with twentieth century thought on pain in animals and the necessity for the administration of analgesics in the reduction of animal suffering.

This incident at the IBR has made it apparent that neither the N.I.H. peer review system nor the U.S.D.A. inspection program works. One must remember that while the NI.H.'s report does what it should, i.e. point out deficiencies and temporarily suspend funding, the N.I.H. cannot cry that it would have taken action earlier if only approached. In fact, the N.I.H. was informed of conditions at the IBR as far back as 1977, when the laboratory was found to have been operating for five years without a license but with N.I.H. funding. The N.I.H. promised then to investigate and remedy problems at the IBR. Dr. Taub might well express suprise that the N.I.H. has now, after eleven years of funding and inspections, finally found serious fault in his laboratory. I should mention that the IBR is located less than fifteen minutes from the N.I.H headquarters in Bethesda.

For the U.S.D.A.'s part, it too received a complaint that the IBR was filthy and operating without a license in 1977. It too promised to "work with the IBR" to clean it up. But, within a week of the complaint, the U.S.D.A. had issued the IBR a license and apparently forgiven its past omissions. Needless to say, even in the face of enormous public concern, the U.S.D.A. has yet to admit there were any major problems with the IBR at any time.

Approximately sixty to one hundred million animals exist and die each year in U.S. laboratories. If only one percent of the thousands of laboratories in this nation are like the IBR, we are faced with a serious ethical problem that must be dealt with in a manner befitting a civilized nation.

Thank you for the opportunity to testify before you today.

Attachments:

Affidavits from Drs. Michael Fox and Geza Teleki, attesting to conditions at the IBR.

AFFIDAVIT OF GEZA TELEKI

My name is Geza Teleki. I am a professional primatologist with twelve years research experience in non-human primates. I teach primatology at the George Washington University. I have a doctorate from Pennsylvania State University and am trained in both psychology and anthropology with a specialty in primate behavior. I have worked with primates in both wild and captive conditions. I am a global expert on primates for the Survival Service Commission on the International Union for the Conservation of Nature and Natural Resources, the largest international organization dealing with primate issues on a global basis.

On August 27, 1981 at approximately 8:30 p.m. I visited the premises of the Institute for Behavioral Research (IBR) at 9162 Brookeville Road, Silver Spring, Maryland in the company of Alex Pacheco.

My first comment must be that I have never seen a laboratory as poorly maintained for animal subjects or human researchers. The premises were filthy, with no sign of having been adequately cleaned for a long period of time and no indication of hygienic controls.

Upon entering the IBR facility I viewed seventeen primates, each in a separate cage. The stench of excreta hung in the air because a) the facility was unclean, and b) the ventilation system is totally inadequate. In fact, stale air from adjoining rooms - not fresh air - is sucked into the primate "colony room". I might mention that because of the direct risk of the transmission of contagious, air-borne diseases between human beings and non-human primates, a primate laboratory is a potentially lethal installation. Besides contributing to an uncomfortable living situation for the animals, the lack of proper ventilation and precaution against the spread of disease from the monkeys to human patients, staff and visitors (and vice-versa) defies all reasonable health standards.

From the drying, discolored condition of some of the animals' wounds, it is obvious that monkeys are permitted to continue with untreated lesions and injuries for days and even weeks at a time. I observed several monkeys with unbandaged, open wounds on their arms, including lesions of two or more inches in length - a serious matter on a fourteen inch monkey. These wounds require veterinary attention, yet there was evidence of none. I observed dried, exposed muscle tissue and exposed bones on two of the monkeys and a third monkey had a badly swollen right arm which appeared broken. Again, there were no signs whatsoever of treatment having been administered.

No food receptacles were provided for the animals in the colony room and the monkey chow "biscuits" were small enough to have dropped through the cage mesh floors into the excreta troughs below. Monkeys, like human beings, use their hands to manipulate food and get it into their mouths. Monkeys who are now physically impaired - as many of these are - cannot be expected to feed themselves as capably as those who are not handicapped. The handicapped monkeys, therefore, are deprived of proper food when they must go against their natural instincts and retrieve contaminated food from the excreta trays into which it falls.

AFFIDAVIT OF GEZA TELEKI - Page Two

In some cages, so much wire was sticking up out of the floors that, although the size of the cage itself appeared to satisfy Federal minimum size requirements, the amount of living space had been dramatically reduced. Sharp wire protrusions are a danger to the health and well-being of all monkeys. Animals with deafferent limbs cannot avoid injuring themselves on these sharply projecting objects. The appalling filth of the cages further deprived the animals of the little space they have been allotted.

Macaques are diurnal monkeys; normally active during the day and asleep at night. At IBR the timing device which regulates the number of hours of darkness and light the monkeys in the colony room will receive is broken. So, not because of a research protocol, but because of neglect, these monkeys are being kept in a room where the lights are kept on day and night. The circadian rhythms of monkeys kept in perpetual light are disrupted and they suffer from stress. Unable to maintain regular behavioral patterns, this sort of interference causes secondary problems and serious psychological consequences have been documented.

A disregard for the physical and mental health and wellbeing of the primates I observed was perhaps most obvious in the lack of compensation that has been made for their laboratory-induced impairments. Even lay persons realize that monkeys with one or two deafferent arms cannot function normally in a lot of basic, vital maintenance activities, such as feeding and self-grooming. Thus, many of the monkeys have lost fingers not because the experiments have required this, but because routine precautions have not been instituted to prevent mutilations and injuries, procedures have not been adopted to compensate for disabilities, and veterinary medical care has not been provided to tend injuries and wounds.

In closing, I must say, from a human health point of view, I would not dare to work in conditions such as those I observed at IBR. Moreover, as far as the care and treatment of the animals within that institution is concerned, it is my professional opinion that they are suffering in many different respects, including from the unnecessary deprivation of veterinary medical attention and from improper air, light, space and food.

Geza Teleki

Geza Teleki

District of Columbia : SS

Subscribed and sworn to before

me this 3rd day of August 1981

AFFIDAVIT OF MICHAEL W. FOX

I am Michael W. Fox. I have a degree in veterinary medical science from the Royal Veterinary College, London, England, a PhD in medicine from London University and a Doctorate of Science in ethology from London University.

From 1964 to 1967 I was Medical Research Associate for the State Research Hospital in Galesburg, Illinois. From 1967 to 1969 I was Assistant Professor of Biology and Psychology at Washington University, St. Louis, Missouri and Associate Professor of Psychology there from 1969 - 1976. In 1976 I became Director of the Institute for the Study of Animal Problems in Washington, D.C. and remain so today.

I am a member of the American Association for Laboratory Animal Science, the American Association for the Advancement of Science, the British Veterinary Medical Association, the American Veterinary Medical Association, the Royal College of Veterinary Surgeons, the Animal Behavior Society and many other organizations.

My principal areas of expertise are in laboratory animal husbandry, animal behavior and animal welfare science.

On August 28, 1981 at approximately 9 p.m. I visited the Institute for Behavioral Research animal warehouse facility at 9162 Brookeville Road, Silver Spring, Maryland in the company of Alex Pacheco.

The facility was in an extremely filthy condition, especially the room in which the majority of primates were housed. Fecal matter was observed matted into cage surfaces and mold was growing on piles of fecal matter allowed to accumulate on cage floors. Mice urine and droppings were evident throughout the rooms. The interior cage wires were broken in a number of cages, exposing the primates to the danger of injury. Ventilation was inadequate, jeopardizing personnel health as well as that of the monkeys, by allowing air from the "colony room" to pass into the corridor used by human patients and staff.

The surgery facility was a mockery, with much of the equipment in disarray and the only sink in the room filthy. The icebox in the refrigerator was frozen over. Inside it, drugs were strewn about beside a bag of black, rotted apples. As for the system built to deliver electric shocks to the monkeys, it is my opinion that it is so crudely designed that there is no way of knowing what comes out of it.

The condition of the monkeys was overall one of unthriftiness, with dull coats and denuded, rat-like tails - possibly as a result of self-mutilation. The animals were being kept under extremely deprived conditions, unable to seek relief from the contaminated cage floors, forced to inhale the ammonia and fumes from their own excreta, deprived of natural, social contact and with nothing to touch or manipulate, not even a resting board or food dish. Further, the monkeys I viewed were being deprived of darkness within a twenty-four hour time frame. To deprive them of darkness is not only stressful to them, but has been shown to increase their susceptibility to infection.

Of particular concern was a monkey with a left foreleg laceration, possibly induced by self-mutilation. A bandage it had been wearing had apparently been pulled off and through the cage mesh by the neighboring monkey. The wound needed stitching and I could see through the skin to the exposed connective tissue covering the muscle. The wound was discolored, dried in part and exposed to further infection.

A second monkey had a laceration to the posterior part of its foreleg and was picking into the wound. A failure to repair broken wires at the front of this monkey's cage may have caused the injury.

Another monkey had a badly swollen forelimb with a serum pocket. This limb appeared to be fractured and it is probable that the animal was also suffering from peracute infection.

Yet another monkey had some of its fingers removed. A great deal of granulation and inflammation was evident at the site of the loss. This monkey was - and had clearly been for some time - suffering from chronic infection.

It is noteworthy that fecal contaminants are not conducive to wound healing and may lead to general systemic infection. The heavy build-up of feces and the remains of rotting, matted bandages are obvious sources of infection. No provisions to control the spread of disease and infection, such as a pressure hose, cage washing facilities, etc., were in evidence.

Monkeys are highly complex, social animals with an emotional system much like our own. It is my professional opinion that the monkeys I viewed at the Institute for Behavioral Research on August 28, 1981 were, without exception, suffering unnecessarily from various causes, including physical and psychological deprivation, a lack of veterinary care and a failure to provide proper, basic environmental needs.

Michael W. Fox

Michael W. Fox

DISTRICT OF COLUMBIA) ss:

Subscribed and sworn to before me this 31st day of August, 1981.

Christine E. Lanzoir, Notary Public

Mr. **Walgren**. Thank you very much, Mr. Pacheco.

If I might begin just briefly and then turn to the other members, how did you happen to become associated with this laboratory?

Mr. **Pacheco**. I had a summer free. I had just gotten out of school at George Washington University and I wanted first hand research experience inside a laboratory, because often I am criticized for never having even been in a laboratory. So I looked in the USDA listing of registered research facilities and found the one closest to my home, which was the IBR laboratory. I just knocked on the door and asked if there were any jobs available, and they said no. I asked if they would take anyone on a volunteer basis, and they said yes. And within 1 week I was in charge of a pilot research study.

Mr. **Walgren**. So it was selected at random at that point?

Mr. **Pacheco**. Yes sir.

Mr. **Walgren**. How much time did you spend there in that capacity?

Mr. **Pacheco**. I would spend about 3 to 4 hours a day, usually, and then just about 4 days a week.

Mr. **Walgren**. Were you aware of any Government inspections by either the NIH or the USDA during the time you were there?

Mr. **Pacheco**. Three weeks before I arrived at the laboratory USDA had made an inspection and found only, two minor deficiencies. And then 8 weeks after I arrived and while I was still there, USDA made a second inspection and found no deficiencies.

Mr. **Walgren**. And these conditions which have led to the revocation of the funding, as I understand it, by NIH, did exist at the time USDA made those inspections?

Mr. **Pacheco**. There is no question about it, they existed.

Mr. **Walgren**. What can you tell us about the amount of resources that were committed by the Institute to care for the animals?

Mr. **Pacheco**. I should mention that Dr. Taub has four research grants right now at this point. One of those deals specifically with the 16 surviving primates. That particular grant from NIH for this year is $115,000. I should also mention that only two persons—part timers—were assigned to go in there and cleanup and feed the animals, once a day, and they were paid $10 a day. The laboratory claimed that they also spent 55 cents per day per animal to cover feeding costs.

Mr. **Walgren**. Is that information from records that were——

Mr. **Pacheco**. That is from their own research grant proposal and from the NIH investigative report.

Mr. **Walgren**. So that amount of effort was approved by NIH in granting those funds?

Mr. **Pacheco**. Yes, it was.

Mr. **Walgren**. When you became aware of these things, why did you go to the local police as opposed to the people that had the responsibility to assure this kind of condition is safeguarded against?

Mr. **Pacheco**. I went to the police roughly 3 months after I started there, because that is when I found out there were legal actions that could be taken. By that time I had become aware that the laboratory had been complained about to NIH and to the

USDA in 1977, I also knew that this laboratory had its own scientific animal care committee which made annual trips through the laboratories and made their own inspections, and I knew the scientists in there were aware of the conditions. So I didn't have any faith in taking this to them because I had a very strong feeling that they would do virtually nothing with it and just repeat what they had done in 1977.

So I put together the photographs and other evidence and I took it to the police, where I felt we would have a much better shake.

Mr. WALGREN. If that laboratory had been in Virginia, would you have been able to go to the police in Virginia?

Mr. PACHECO. I doubt it, because in most States in this country laboratories are exempt from any of the cruelty laws that exist on the State level. They don't have to abide by such cruelty laws as most people are aware of.

Mr. WALGREN. So Maryland was——

Mr. PACHECO. Was an exception. It is one of the few States that do not exempt them from acts of cruelty to animals.

Mr. WALGREN. Why do you think the peer review system broke down or led to the approval of these kinds of conditions?

Mr. PACHECO. Basically because the people in the peer review system are appointed by their colleagues, people who are doing basically the same kind of experimentation. And amongst those groups of professionals, at least on self-criticism or criticizing of their fellow scientists, it is almost unheard of in terms of how they treat animals.

Mr. WALGREN. Was there any outside individual on the animal care committee that you have become aware of in this instance?

Mr. PACHECO. I think that of that animal care committee a large number of those five—I'm not sure of the exact number—did not work at the laboratory but were outside people. Such as the chairman—I'm not 100 percent sure of this, but as far as I know, Dr. Rioch was just on the animal care committee. I had never seen him in the laboratory and was not aware if he ever did or does work at the laboratory. So I think they were outside scientists.

Mr. WALGREN. You would not know one way or the other whether there was some employment or professional association between the people on the animal care committee and this particular institute?

Mr. PACHECO. I am not aware of that.

Mr. WALGREN. Going into a situation like that, I have been wondering whether constant exposure to treatment of animals under situations that we all would probably adversely react to doesn't desensitize somebody so much so that you need to have some outside judgment or outside review.

Was there anything in the laboratory that you saw which would lead you to believe that these people were desensitized?

Mr. PACHECO. Yes, I think that is a very good point, because there is no question in my mind that everybody that worked there was desensitized by the things that went on in the laboratory. Never once in the entire 4 months that I was there did anyone ever complain about the conditions of the animals or express any sympathy or any feelings for the animals. I think that that is a very crucial reason why we need independent inspections of these laboratories, because the people that are working in there do become very insensitive to what is being done and we need outside, independent people to come in and take a more objective look at what is really happening.

Mr. **Walgren**. I noticed in the pictures passed around there is apparently some kind of a paperweight or desk fixture made out of a monkey's hand. Where was that particular artifact?

Mr. **Pacheco**. That's a monkey's hand that was cut off at the wrist, and it was used as a decoration piece and a paperweight on Dr. Taub's desk in his main office. He is the principal investigator and the head researcher at this laboratory.

Mr. **Walgren**. I would like to turn to other members at this point.

Mr. McCurdy?

Mr. **McCurdy**. Thank you, Mr. Chairman.

Mr. Pacheco, I think from the testimony presented, of course, the statements in the media and the pictures that you have here, that there is no question that this was a grotesque situation and, if anything, a very unsanitary working environment. I don't think any person on this panel or on this subcommittee would condone such action. But being an attorney, I think we must build a record here and I want to get into some specifics—and I appreciate your short and concise answers that you have been giving—but maybe we can pin down some of the specifics here and find out where we are.

You made a statement earlier that—you said you were criticized for not ever being in a lab before. Who was criticizing you and why were you being criticized?

Mr. **Pacheco**. Whenever I would be at a public event, such as the proceedings that our university organization had that correlated with the NIH symposium on alternatives, whenever speaking with reporters and other researchers, they always asked the question, "Well, have you ever been in a laboratory; have you ever done research? How do you know what you're talking about?" Those are the types of questions.

Mr. **McCurdy**. So this is in response to your position as chairperson of the People for the Ethical Treatment of Animals and the GW Ethics and Animals Society? You have been involved in this area before——

Mr. **Pacheco**. Yes.

Mr. **McCurdy** [continuing]. And these positions didn't occur after you worked in the lab, but you have been involved in this area for some time?

Mr. **Pacheco**. About 3 years, yes.

Mr. **McCurdy**. And you stated you were really looking for just on-the-job experience, so to speak?

Mr. **Pacheco**. Yes.

Mr. **McCurdy**. First of all, this entire area is still subject to suit; is that right?

Mr. **Pacheco**. Yes. There is a criminal case coming up later this month.

Mr. **McCurdy**. Has there been any civil action——

Mr. **Pacheco**. No, not at this point.

Mr. **McCurdy**. How large is this IBR laboratory?

Mr. PACHECO. It employs about seven people. It's not a very large facility.

Mr. McCURDY. What number of professional researchers or professionals would you say there are?

Mr. PACHECO. Employed, at least four, and one independent researcher that worked there.

Mr. McCURDY. Now, are these people with Ph. D.'s, master's, M.D.'s——

Mr. PACHECO. Ph. D.'s and Master's.

Mr. McCURDY. How many Ph. D.'s would you say there are?

Mr. PACHECO. Two to three.

Mr. McCURDY. How many support personnel, four or five?

Mr. PACHECO. Two part-time people to clean and feed, one independent researcher, and another person who just did research with humans.

Mr. McCURDY. How large a physical plant is there, how large a building?

Mr. PACHECO. I would say it's about—oh, 200 to 300 feet long—twice as long as this room, roughly, and about the same width.

Mr. McCURDY. So it is not an extremely large facility?

Mr. PACHECO. No, just one floor, one story, and it is located in a warehouse district. It's a converted warehouse, actually.

Mr. McCURDY. First of all, who took the photographs that you presented?

Mr. PACHECO. I took all of those.

Mr. McCURDY. Do you have dates for these?

Mr. PACHECO. Yes, I do. They're in my briefcase.

Mr. McCURDY. Were they all about the same time?

Mr. PACHECO. No, those were over the 4-month period, roughly over 3 months and 2 weeks.

Mr. McCURDY. When did you first report these problems to the director of the lab itself?

Mr. PACHECO. About the second day I was in the laboratory. I didn't point out all of them. I pointed out the injured animals that were bleeding in their cages.

Mr. McCURDY. From the photographs there is no question that it would appear to be very unsanitary. But you personally have no other experience as far as other private laboratories to determine whether this is a highly unusual case, an average case, or a——

Mr. PACHECO. No. That's the problem. It is very difficult to get into laboratories unless you are being given a guided tour. And under those conditions, you are very limited as to which rooms you can go into.

Mr. McCURDY. How many reviews or inspections took place while you were at the facility by outside agencies or——

Mr. PACHECO. While I was there, just one.

Mr. McCURDY. Do you recall the date of that?

Mr. PACHECO. It was July 13.

Mr. McCURDY. And who conducted that investigation?

Mr. PACHECO. Dr. Perry. He was a doctor of veterinary medicine and a USDA inspector.

Mr. McCURDY. How was that investigation instituted or why was it instituted, do you know?

Mr. PACHECO. It was a regular inspection. He had inspected the laboratory 3 weeks before I first arrived and noted that there were some peeling tiles on the floor of the colony room and had instructed that those peeling tiles be replaced within 45 days. Then he returned July 13 to see whether or not they had been replaced. They had been.

Mr. McCURDY. One of the photographs is of a—it looks like a refrigerator or something like that——

Mr. PACHECO. Yes.

Mr. McCURDY [continuing]. That had either drugs or food or——

Mr. PACHECO. It is a medication refrigerator.

Mr. McCURDY. It didn't even look like it worked, much less because of the filth inside of it in the corner.

Is this an area that was inspected by those investigators?

Mr. PACHECO. According to the inspector, he walked through the facility. I don't think he specified which rooms he went into. But that is a room where the only incubator is kept. It is the room directly adjacent to the colony room. Experimentation is done in that room also. That is where the conditioning chamber, which has splattered dried blood in it, is also located.

I might mention that all the medication in that refrigerator—and it is the only medication refrigerator in the laboratory—had all expired. Most of it expired in 1979; some had expired as far back as 1969. That was all confiscated by the police.

Mr. McCURDY. It raises a question on whether you could even see the tile through the filth, if that's what he is looking at.

Mr. PACHECO. Yes. I'm surprised he saw it.

Mr. McCURDY. You heard testimony this morning about possible corrective legislation. In your experience at this particular laboratory from what you heard this morning do you feel that this corrective legislation would be able to have prevented the conditions that existed at IBR?

Mr. PACHECO. I think that the most serious problem I have heard of, that I have concerns about, are statements relating to setting up another system which actually, you know, exists already, where the scientists and the experimenters police themselves. I think that is a critical point. That is the way it has been done for the last 100 years, and I do not think things will ever change unless we get independent people in there to monitor and actually see what is being done.

Mr. McCURDY. I think an extreme burden should be placed upon NIH or whoever is issuing the grants to review and certainly look at the protocols and to determine whether or not conditions like this would even insure any accuracy of the testing itself or the studies. I have severe questions about any results coming out of a place like this, again based solely upon the photographs that we have in front of us, some of the testimony we have heard and looking at the media.

I would caution the committee, of course, that since this is an area that is being involved in criminal action we probably are walking in a very troubled area or on thin ice. But I think, from what we have seen this morning, that more should be done than just looking at the question of the animals. I think the whole spectrum of how we review the grants that are awarded needs to be looked at, and also the general conditions of the laboratories receiving them.

Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you very much, Mr. McCurdy.

Mr. Brown.

Mr. **Brown**. No questions.

Mr. **Walgren**. Mr. Skeen.

Mr. **Skeen**. Thank you, Mr. Chairman.

Mr. Pacheco, prior to going to IBR, how long had you been chairman of the Ethical Treatment for Animals?

Mr. **Pacheco**. One year.

Mr. **Skeen**. One year?

Mr. **Pacheco**. Yes.

Mr. **Skeen**. How large an organization is this?

Mr. **Pacheco**. It is a small, local activist organization. It is 1 year old. It has about 20 to 30 active members.

Mr. **Skeen**. Is it affiliated with any other nationwide group?

Mr. **Pacheco**. No.

Mr. **Skeen**. Do you know of any nationwide group of this kind?

Mr. **Pacheco**. That takes the same positions we take? Yes, there are one or two national organizations such as the Society for Animal Rights.

Mr. **Skeen**. Are they student organizations?

Mr. **Pacheco**. No, sir, they are not. They are membership organizations that just take general membership from the public.

Mr. **Skeen**. But you had been the chairman of this about a year before you volunteered at the lab?

Mr. **Pacheco**. Yes. One year in August, roughly.

Mr. **Skeen**. All right. Thank you, Mr. Chairman.

Mr. **Walgren**. Mr. Shamansky.

Mr. **Shamansky**. Thank you, Mr. Chairman.

Mr. Pacheco, there is no question that the conditions that you have testified to, have witnessed, are disturbing to anybody, and the pictures are almost too difficult for me to even look at. But I would like to pursue with you the general principle that you are pursuing here, namely, is it your organization's position that there is no validity to medical experiments with animals?

Mr. **Pacheco**. I think it is clear that much research done on animals cannot be extrapolated to humans, and I think virtually any creditable scientist would tell you that. But our position—my personal position—is that I am against experimentation that is done on animals, including humans, that is done against their will, and I think that the ethical cost is just too high.

Mr. **Shamansky**. Now, I think we can agree it is very difficult to gain the assent of an animal other than a human with respect to his will. I think we are in agreement. So then logically you would eliminate any kind of animal experimentation?

Mr. **Pacheco**. A great deal of it, yes. I do not oppose such things as ethological studies of animals in their natural environmental.

Mr. **Shamansky**. That is the general principle that you are advocating?

Mr. **Pacheco**. Yes.

Mr. SHAMANSKY. OK. Now, based on your experience, are you familiar with any situation in which experiments with animals have led to benefits for humans, that you can make a correlation?

Mr. PACHECO. A correlation as to——

Mr. SHAMANSKY. That you would experiment on an animal and then having done that, advance the experimentation with humans.

Mr. PACHECO. No; I cannot think offhand of animal experiments that have benefited humans.

Mr. SHAMANSKY. You personally know of none. You are not assuming that there have never been.

Mr. PACHECO. Yes; that is correct.

Mr. SHAMANSKY. OK.

There are more than a few lawyers around here, I am sure, and one of the first lessons you learn, or one of the catch phrases in law school is that "hard cases make bad law." And, clearly, this is a hard case, the conditions in this laboratory. I even hate to call it a laboratory. The burden that I face is do I then generalize from this situation and talk about all such laboratories.

I was at one time chairman of the Legal Ethics and Professional Conduct Committee of the Ohio State Bar Association, and we even found some unethical lawyers. That may surprise you, you know [laughter]—a very few. But they did exist. So it seems to me that we can say that this is a bad case. The question is, What good law can come out of it?

I gather from your basic principle that, short of prohibiting animal experimentation, no good law could come out of this case.

Mr. PACHECO. No; I have to disagree with that. I think that a very crucial thing that should be done, in my opinion, is that laboratories need to have their cruelty exemptions lifted, and the public should be allowed to be informed as to what is being done to animals in the laboratories. Right now they are excluded from that type of knowledge. Only the people who are supplying the funds for the experimentation are allowed to know what is taking place.

Mr. SHAMANSKY. Is it your opinion that the system, as it is today, cannot be made to work properly, or it just did not work properly in this case? In other words, your sample, you have a sample of one here, and I just want to be careful about generalizing from the sample of one.

Mr. PACHECO. No; I firmly believe that the system as it stands right now will not work because it is, again, the buddy system, the peer review system, and they never have and they are not about to start self-criticizing one another.

Mr. SHAMANSKY. Is it possible that you have begun that process of self-criticism?

Mr. PACHECO. I do not know. There has not been any self-criticism yet, only under a lot of pressure did NIH finally come in and make an inspection. As I mentioned earlier, these types of problems were pointed out to them in 1977 and they took no action then. Only after the police raided the laboratory last month did they move.

Mr. SHAMANSKY. In your opinion, what has been the response of the NIH since then?

Mr. PACHECO. I think it has been the least that we could expect from them, the least that the public should expect from them, because they have only temporarily suspended funding to this laboratory. And it is my personal feeling that if Dr. Taub is not convicted, that his funding may be reinstituted. IBR is still conducting human research.

Mr. SHAMANSKY. Thank you, Mr. Chairman.

Mr. WALGREN. Thank you, Mr. Shamansky.

Mr. McCURDY. Will the Chairman yield? I have one question.

Mr. WALGREN. Be happy to.

Mr. McCURDY. I understand the court ordered the animals returned to the facility; is that correct?

Mr. PACHECO. Yes, sir.

Mr. McCURDY. What was the basis of that decision?

Mr. PACHECO. I do not think there are too many people who are aware of that because those decisions were made in chambers by the judge. They were not made in open court. The judge never listened to any of the testimony by the State's experts when he made those decisions, and to this day has not listened to any of the expert testimony.

Mr. McCURDY. Mr. Chairman, will there be someone later this morning that can tell us who licenses laboratories and the general regulatory measures regarding that? Will that come out later this morning?

Mr. WALGREN. I believe it should. The NIH and the USDA witnesses should be able to be responsible for that.

Mr. McCURDY. OK. I have one followup on Mr. Pacheco.

From the excellent question Mr. Shamansky asked, is it your contention, though, and the contention of your organization, that there is no benefit whatsoever from animal experimentation?

Mr. PACHECO. No; I would not say that, because you could also say that there is no benefit from human experimentation. I do believe, though, that the ethical costs are too high. We could probably gain a lot of knowledge if we continued to experiment on the retarded or on prisoners as we did in the past, but I think that we brought have ourselves to the point where we realize that it was too unethical to continue doing so, and I think that we should show the same responsibility to the other animals.

Mr. McCURDY. How far do you carry that? I mean, do you carry that to all warmblooded animals? Do you carry that to rats and mice? How far do you go down?

Mr. PACHECO. I take it as far as you have a living, sentient animal that feels pain and can feel pleasure, also. I think we need to keep asking the question, Can the animal suffer? And if we are inflicting suffering on that animal, that we should act in an intelligent and civilized way to find alternatives to that type of experiment. And I think if we seriously apply ourselves to that we can gain that knowledge without inflicting suffering.

Mr. McCURDY. Now, you are talking about perhaps alteration or any physical treatment; you are not talking about—as my wife is a physician and psychology grad also said, running rats or running mice, you know. You are talking about physical changes, experimentation, vivisection, this type of thing?

Mr. PACHECO. Yes, I am.

Mr. McCURDY. Where do you draw the line? You say no animal research whatsoever?

Mr. PACHECO. Well, I am opposed to live-animal experimentation, but I am very much for and strongly support any measures that will help alleviate or eliminate suffering. So even though I am against live-animal experimentation, I strongly support in particular one piece of legislation that is before the committee, because it will, without question, help the situation, in my opinion.

Mr. MCCURDY. Again, I am still trying to pin down the answer.

Mr. PACHECO. Where do I draw the line?

Mr. MCCURDY. Are you saying that you do not condone the research and use of animals in any research whatsoever? Is that what you are saying?

Mr. PACHECO. In most research I do not condone it.

Mr. MCCURDY. Do you feel that is the extreme position?

Mr. PACHECO. I don't know. I think that with the general public it is not so extreme as we might think it is, because of the large response that the Congress has received.

Mr. MCCURDY. But in the scientific community you have staked out the extreme position?

Mr. PACHECO. Yes; no question about that.

Mr. MCCURDY. Thank you.

Mr. WALGREN. Thank you, Mr. McCurdy.

Mr. Weber.

Mr. WEBER. Thank you, Mr. Chairman.

Mr. Pacheco, I would like to clarify a point, does your organization interest itself or become active at all in treatment of agricultural livestock?

Mr. PACHECO. Yes; we concern ourselves and work on virtually any issue that involves animal abuse.

Mr. WEBER. Are you seeking legislation that would pertain to the treatment of agricultural livestock?

Mr. PACHECO. I know legislation has just been introduced, but we have not become actively involved in that. But we do support those types of actions.

Mr. WEBER. And in that case it is not so much research or testing that you are interested in as the treatment of lab animals?

Mr. PACHECO. I would guess about 30 percent of our work time is related to animals and research. The rest is spent on animals raised and slaughtered for food, trapping and hunting, and things like that.

Mr. WEBER. I have to ask you a question that comes to mind because of the line of questioning that Mr. McCurdy pursued.

You seem to stake out a fairly absolute position on medical experimentation on live animals. If I understand you correctly, in almost no circumstances do you feel that the benefits or the merits of research or testing are worthy of or justify the costs in terms of suffering to the animals. I assume you include the confinement and breeding of livestock, where the obvious objective is increased production of food. I want you to talk to me a little bit philosophically, if you will.

Is there a tradeoff there that is worth considering, or is your position on agricultural livestock a similarly absolute one, which is to say you cannot make tradeoff between food production and the comfort of animals?

Mr. **Pacheco**. I think that we have an even stronger case in the situation where food animals are concerned, because I know as a fact that human beings do not need animal flesh or any nutrients in animal flesh to remain healthy, and that we could increase the food available for human consumption if we didn't feed so much of it to animals that we end up slaughtering afterwards, only retrieving a small fraction of the amount of protein and other nutrients that we stuffed down their throats to begin with.

Mr. **Weber**. As I understand it then, you are seeking legislation which would indirectly have the effect of denying consumers that choice if they wanted to make it, regardless of whether or not you agree with it, because if it affects food production it affects food availability?

Mr. **Pacheco**. We are not promoting such legislation because I don't think it exists. No bills to that effect exist that I am aware of.

I understand there is a resolution in the House that has to do with simply setting up another committee that would monitor practices, which is very far removed from whether or not people choose to eat meat or not.

I am not sure if I answered your questions.

Mr. **Weber**. I think I understand.

Let me just clarify again, because Mr. McCurdy opened the line of questioning. You make, in your own mind at least, and for the purposes of the legislation that this committee and other committees are considering, no distinction for instance between experimentation on a frog and experimentation on a monkey?

Mr. **Pacheco**. That is true.

Mr. **Weber**. I have no further questions, Mr. Chairman.

Thank you.

Mr. **Walgren**. Thank you, Mr. Weber.

Mr. Pacheco, in your testimony you indicated that you had heard some discussion by someone at the laboratory about whether or not they would get funding for research if you happened to find something interesting. My question is, When you went to work at the laboratory, did the director of the laboratory, or anybody who was in control of the scientific work going on there, sit you down and give you a good explanation of why you were to do X, Y, and Z, and what that was designed to show?

Mr. **Pacheco**. No, sir. The director did sit down with me and go over how I was to conduct the experiment, and he wrote it down and gave me a copy. But that was the extent of that.

Mr. **Walgren**. Does such a copy exist? Do you have that?

Mr. **Pacheco**. Yes; I have the original.

Mr. **Walgren**. Could you submit that to the committee for the record?

Mr. **Pacheco**. Yes.

[The information follows:]

1. 1 Normal & 1 Deaf
2. Move them so they cannot get at another S's food.
3. Don't put them close together
4. Raisins – D. B.
5. Fast S's 23 hr on Sun–Mon (not Sat),
   Speak to A mis & Bob
   Feed S's 1 hr after run
6. Feed (D.B.) thru home cage large center slot
7. Let S's become used to A ~~box~~ with raisins in each well; then only bait 1 well.
8. After S's are playing game well, start video tape.
9. Probably 10 days of baseline, but let's see.
10. Get as many trials a day as possible. They can be quite rapid but bait well(s) at a distance from cage for each trial.

Mr. WALGREN. And in that document was it made clear what the purpose of this experiment was?

Mr. PACHECO. No, sir.

Mr. WALGREN. He told you what to do, but was there any explanation of why?

Mr. PACHECO. No; and when I asked what it was that we were looking for, I was told on a number of occasions very simply that it has never been done before. And that is why another research project was being done, keeping all the monkeys in total darkness for 4 weeks. And I asked, what have you gotten so far and why are we doing this, and I still got the same answer—"Well, it has never been done before and we hope to get something really interesting out of this."

It seems that "interesting" was the key word in their responses. If they came up with something interesting, they would get it published in Science magazine, in which they have two papers in print now. And that seemed to be their goal, to get their papers published in Science magazine.

Mr. WALGREN. But wouldn't they have had to tell whoever was funding this work what they were after before they got the funds?

Mr. PACHECO. Yes; that is what was done by Dr. Taub with his grant application that involved the original 32 primates, of which there are only 16 left now.

But from that group he pulled the two primates that he gave to me to work with, and then another researcher there, Georgette Yakalis, was doing darkness studies with the same two animals inside the colony room. So, in fact, the same animals were being used in three different experiments at the same time, while NIH was paying for all of the monkeys for just one experiment.

Mr. WALGREN. So you feel that there is some indication that there was piggybacking of the experiments on NIH funds——

Mr. PACHECO Yes, sir.

Mr. WALGREN [continuing]. Piggybacking of experiments that had not been approved by NIH?

Mr. PACHECO. To my knowledge, I have never had any indication that they were approved by NIH. And I was also told that a drug test was going to be done on four of the monkeys.

Mr. WALGREN. You mentioned in your testimony the cost of these animals. Would you go over that again with me?

Mr. PACHECO. I know that the monkeys were purchased for $200 apiece. They were brought in from the wild. I know that Dr. Taub has stated to the press that the animals are worth somewhere between $60 and—originally he had said they are worth $100,000 apiece now, which brings the total to something like $1.6 million. But I know they were purchased for $200.

Mr. WALGREN. How did Dr. Taub arrive at that higher figure?

Mr. PACHECO. I don't know. That is something that we have been trying to pin down, also.

Mr. WALGREN. You mentioned in your testimony that Dr. Rioch, the chairperson of the IBR's animal care committee, made a statement about pain.

In what context was that statement made? And, to give you the statement, he said, "applying human expectations of pain to animals is inappropriate because pain is primarily a matter of societal conditioning to which animals are not subject." Where does that quote come from?

Mr. PACHECO. That comes directly from the NIH investigative report that was made public last Thursday. I took it directly out of that report.

Mr. WALGREN. Did you have any contact with the animal care committee of this facility while you were there?

Mr. PACHECO. No; never.

Mr. WALGREN. Well, the questions related thereto would properly be addressed elsewhere.

Perhaps it makes sense to put in the record at this point the list of the animal care committee as taken from the NIH Committee's site visit report and, without objection, I will leave a notation in the record to insert that at this point.

[The information follows:]

EXCERPTED FROM THE NIH COMMITTEE'S SITE VISIT OF THE IBR SILVER SPRING FACILITY

Before proceeding to an examination of the physical facility, the committee conducted a three hour interview with the following IBR associates: (1) Edward Taub, Ph. D., Principal Investigator of the NINCDS grant "Effects of Somatosensory Deafferentation", member of the Animal Care Committee of IBR, and Administrative Director of the Behavioral Biology Center; (2) David Rioch, M.D., Program Director of the DRR Biomedical Research Support Grant, Chairman of the Animal Care Committee, and Director of IBR's Behaviorial and Biomedical Science Support Services; (3) Solomon Steiner, Ph. D., member of the Animal Care Committee, former collaborator with Dr. Taub on deafferentation research, and Director of the IBR's research facility at the City College of New York; (4) Paul Hildebrandt, D.V.M., member of the Animal Care Committee, consulting veterinarian of the IBR Silver Spring laboratory, and not otherwise associated with the Institute; and (5) Joseph Vasapoli, Chief Executive Director of IBR.

Mr. WALGREN. Mr. Roe.

Mr. ROE. Thank you for the courtesy, Mr. Chairman. Albeit from the point of view that I am not a member of the subcommittee, I am a member of the full committee, as you know.

I listened intently to Mr. Pacheco's testimony, and for the benefit of my own observation and that of the committee, your credibility is being attacked here by the questioning. I trust you are aware of that situation, and your honesty is disarming. And that is to your credit, sir. But let me ask a couple of questions if I may.

Did you enter the laboratory or take this job in the laboratory in a conscious predetermined direction to look into this matter because you wanted to further the aims of your organization?

Mr. PACHECO. No. I should state that I have done field research twice before, once in Alaska and once with Urban Wildlife in D.C.

Mr. ROE. But you made the comment that when you went out and you looked, you drew circles and said well this is the nearest thing I can find in a laboratory toward my home, and let me go try there. You said that you went ahead and they did not have a job for you but you did volunteer and they accepted you as a volunteer. Is that correct?

Mr. PACHECO. Yes.

Mr. ROE. The second point is, when you discovered your concern of the issue, did you take those matters at all up with the members of the staff or Dr. Taub or anybody else, expressing you were concerned about this and shouldn't we be getting this cleaned up?

Mr. PACHECO. Yes, I did.

Mr. ROE. Or did you just ignore the organization and go off on your own?

Mr. PACHECO. No, I brought up the fact when Dr. Raub was with me looking at the animals in the colony room, I pointed out and asked him if some of these animals didn't need treatment when I saw them with large open wounds on their arms.

Mr. ROE. Your philosophy, and what you feel, which I as a fellow human being totally respect, has no bearing, however, upon this committee's hearings, other than it is nice to hear what you have to say. The point of view that as far as this Member of Congress is concerned, probably before you were born, if you have a sense of humor, is that we have been working on this kind of legislation simply because of the fact that the issue is there and has been, way before this Member or any other Member that I am aware of knew anything about this monkey case to begin with.

So albeit the point of view, that it may be referred to as a hard case, it is one out of probably hundreds or thousands.

And I think the fact, Mr. Chairman, that we are even spending our effort and our energy in this committee to bring this matter to the attention of the Congress, is evidence that Mr. Pacheco is performing a great service, even though his philosophy may be that animal testing of any nature may not be appropriate.

So I think that for myself and for our members here, I do trust that the Pacheco matter does not become the rallying point, either pro or con, on this legislation. The problem exists, and the problem ought to be addressed by the Congress of the United States, Mr. Chairman.

Thank you.

Mr. WALGREN. Thank you, Mr. Roe.

Mr. SHAMANSKY. Mr. Chairman, if the chairman would yield a moment, with respect to my colleague's comment about the intention of Mr. Pacheco in going there with no thought of finding something, frankly, I do not think that would invalidate what he found, one way or the other. Either the conditions exist or they don't exist, and I personally would not feel bad if that had that been your intention. I accept the fact that it was not.

Mr. ROE. If the gentleman will yield——

Mr. SHAMANSKY. Certainly.

Mr. ROE. I seem to note—and I do not think you were here early in our initial presentation by myself and Mrs. Schroeder—I just did not want to see the hearings go in the direction that the determination of this entire issue would be based upon the credibility of the witness' psychology and philosophy.

Mr. SHAMANSKY. I agree.

Mr. ROE. I did not think you meant that, of course.

Mr. SHAMANSKY. No, I did not, but had it been his intention of exposing something bad, it wouldn't change—

Mr. ROE. To me that would have been honorable, too, as far as I am concerned.

Mr. SHAMANSKY. I think so too.

Mr. WALGREN. I want to join in the remarks of Mr. Roe in saying that what we are interested in is what you saw, and we are interested in what was told to you and what you are able to report, not your overall philosophy about the role of animals in research. Our responsibility is to deal with the facts, as was said earlier, and if the facts warrant a change being made in the laws of the land, then that is our responsibility and it does not flow from anybody's philosophy.

There was one point that I wanted to make and did not. Is it my understanding that when the investigator at IBR said we will find something interesting, that it was also said in the context that if we find something interesting we may get funding for it?

Mr. **Pacheco**. Yes.

Mr. **Walgren**. So is it your impression, from your contact with personnel at that laboratory, that the public funds were being used to conduct experiments that had not been approved by any research funding system that we have now in place and they were being conducted in order to secure more funding?

Mr. **Pacheco**. Yes, as far as I know that is the essence of everything I was told. I realize, though, until yesterday, that NIH was probably never aware of these other experiments.

Mr. **Walgren**. I see.

Mr. **Pacheco**. It was brought to my attention.

Mr. **Walgren**. Well, on behalf of the subcommittee I want to express my appreciation for the role that you have played in this, and we hope that something good will come out of all of our exposure to this particularly unacceptable situation. Thank you very much, Mr. Pacheco.

Mr. **Pacheco**. Thank you.

Mr. **McCurdy**. Mr. Chairman.

Mr. **Walgren**. Mr. McCurdy.

Mr. **McCurdy**. I think it should be restated, that in my understanding this is a case study and that we are not here to try the merits of any particular laboratory, but that this was given as an example to again stake out an extreme position or to demonstrate some of the areas where perhaps there has been abuse and not to try the entire laboratory system throughout the country and research facilities, and that this is not given as an example of the standard but hopefully this is part of the deviation.

Mr. **Walgren**. From my personal viewpoint, it should let us now find out why this particular instance happened, and it may be that we ought to be trying to change the reasons why this happened.

Mr. **McCurdy**. Right. I just want to make sure and make it clear to everyone here, we are not trying to micromanage NIH or determine the particular merits of an individual case. Again, we are looking at the broad spectrum of the problem and hopefully trying to ascertain what is the mean and what NIH and other agencies, regulatory bodies, are doing to prevent such a thing. Again, perhaps funding is the question, I think. And these are the questions I would like to get into with the next witnesses.

Mr. **Walgren**. The next witness is Dr. William Raub, the Associate Director for Extramural Research and Training at the National Institutes of Health.

Dr. Raub is accompanied by Dr. Joseph Held, the Director of NIH Division of Research Services and Dr. Gary Flamm, Associate Director for Regulatory Evaluation, Division of Toxicology, for the

Food and Drug Administration. We want to welcome you to the committee, gentlemen.

Your written statements will be made a part of the record, and please feel free to proceed as you would. We are most interested in your reactions to the developments that have been revealed at the Silver Spring laboratory, and we are very interested in how you, as governmental people, have tried to make sure that the right things happen in this area, and the procedures that you use to try to assure the public that that is happening.

We will start with Dr. Raub, and if the others have testimony we would be glad to hear from them, too.

Dr. Raub.

STATEMENT OF WILLIAM F. RAUB, ASSOCIATE DIRECTOR FOR EXTRAMURAL RESEARCH AND TRAINING, NATIONAL INSTITUTES OF HEALTH, ACCOMPANIED BY JOE R. HELD, DIRECTOR, NIH DIVISION OF RESEARCH SERVICES; AND W. GARY FLAMM, ASSOCIATE DIRECTOR FOR REGULATORY EVALUATION, DIVISION OF TOXICOLOGY, FOOD AND DRUG ADMINISTRATION

STATEMENT OF WILLIAM F. RAUB

Dr. Raub. Thank you very much, Mr. Chairman.

My written statement is brief. It addresses directly or indirectly many of the issues we have discussed this morning, and with your permission I will read it.

My name is William F. Raub. I am the Associate Director for Extramural Research and Training at the National Institutes of Health. Today I am representing the Department of Health and Human Services to discuss the care and use of animals in biomedical research and testing. Accompanying me are Joe R. Held, DVM, Director of the NIH Division of Research Services and W. Gary Flamm, Ph. D., Associate Director for Regulatory Evaluation, Division of Toxicology, Food and Drug Administration.

It is almost impossible to exaggerate the importance of laboratory animals in the search for new or improved means to treat, prevent and cure human disease and to rehabilitate people whose disabilities cannot be reversed completely by modern medicine and surgery. Virtually every major advance in health care stems in whole or in part from research performed with animals. Moreover, the application of new health care measures to people before there has been sufficient animal experimentation sounds a counterpoint that cannot be ignored. The thalidomide tragedy is an example.

There is no way the NIH could fulfill its statutory mission if the use of laboratory animals were made subject to severe constraints. Research on critical aspects of cancer, heart disease, diabetes, brain dysfunction, and environmentally caused disorders, to name but a few, would come to a virtual standstill. And with the diminishing prospect for new and useful biomedical knowledge would vanish the hopes of those who wish to spare themselves and future generations from the ravages of sickness and disability.

But the social imperative for animal experimentation is not a license to take animals' lives needlessly or to inflict pain and suffering that could reasonably be avoided. Abuse of laboratory animals is as inconsistent with good science as it is with good conscience. The scientific community has an obligation to itself as well as to the public at large to treat laboratory animals in accord with good veterinary medical practices and to be able to justify where and to what extent animal experiments are appropriate. The NIH recognizes its role in promoting fulfillment of this obligation and reaffirms its commitment to that goal.

From the perspective of the NIH there are at least four classes of issues associated with the use of animals in research and testing. They are: One, housing and care of laboratory animals; two, propriety and efficiency of laboratory animal use; three, replacement of animals in biological testing situations, and four, development and use of adjuncts to laboratory animal experimentation.

Although each of these issues is of first-order importance, both scientists and laypersons frequently fail to distinguish among them. As a result, activities of research agencies often are assessed against measures and expectations more appropriate to regulatory agencies, and vice versa. And issues repeatedly are confronted with good intentions but without obvious recognition that the requisite expertise differs markedly from one area to another. With these concerns in mind I will discuss each class of issues in turn, summarizing the current status of our efforts in the area and identifying further initiatives we plan to take.

HOUSING AND CARE OF LABORATORY ANIMALS

The primary statute affecting the care and use of laboratory animals is the Animal Welfare Act of 1966 as amended. Responsibility for implementing its provisions and enforcing the regulations derived from it is assigned to the U.S. Department of Agriculture. In 1963, prior to the promulgation of the Animal Welfare Act, the NIH first published its "Guide for the Care and Use of Laboratory Animals." This guide establishes a detailed framework of expectations applicable to both our awardees and our inhouse laboratories. I am submitting a copy for the record.

[The information can be seen in committee files.]

Dr. Raub. Each recipient institution of an NIH award is required to file with our Office for Protection from Research Risks a formally negotiated, written assurance regarding the care and use of laboratory animals. An acceptable assurance is a prerequisite for an award. Failure to comply with the assurance can result in significant penalties, including termination of an award, recovery of funds previously awarded, and ineligibility for further funding. In partial fulfillment of their obligations under these assurances, awardee institutions are required either to be certified by a recognized accrediting organization such as the American Association for Accreditation of Laboratory Animal Care and/or to establish and operate a local animal care committee. Awardees also must agree to comply with applicable portions of the Animal Welfare Act, as well as State and local laws, if any. The NIH traditionally has not conducted routine inspections to monitor compliance with the assurances governing the care and use of laboratory animals. We generally have relied upon principal investigators and officials of awardee institutions to identify and correct problems as they arise. However, whenever particular aberrations come to our attention through such means as project site visits, other administrative interactions with awardees, or expressions of concern by members of the public, we make whatever inquiries seem indicated and follow up with whatever administrative actions seem appropriate.

We continue to believe that this basic approach is a cost-effective way to achieve a high degree of compliance with our laboratory animal guidelines without interfering unduly with the scope and pace of scientific inquiry. Nevertheless, we recognize that we have no fail-safe way to prevent occasional instances of real or apparent misuse or mistreatment of animals; and we take no solace from our belief that such instances are much the exception rather than the rule. We know we must do everything reasonable both to achieve full compliance with our guidelines and to maintain public confidence that such is the case.

In view of the increasing public interest and concern in recent years about the care and use of animals in research settings the NIH is prepared to take further steps to foster compliance with its guidelines and USDA regulations. Specifically, during the next year we plan to initiate a program of site visits to selected awardee institutions to assess the adequacy of animal facilities and animal care practices. Some institutions would be visited on the basis of knowledge about real or potential problems. Other institutions would be selected strictly at random. It should be possible to mount a significant effort within an acceptable level of cost. The information gathered as a result of these visits could quickly become a unique and invaluable data base for judging the nature and extent of animal welfare deficiencies, stimulating corrective actions, and refining NIH guidelines.

PROPRIETY AND EFFICIENCY OF LABORATORY ANIMAL USE

In addition to general concerns about the housing and care of laboratory animals particular research protocols regularly are subject to more specific questions, such as:

Is this experiment worth doing? That is, is it both technically meritorious and relevant to improving human health?

Are animals required to test this hypothesis? If so, has the proper species been selected and does the experimental design evince appropriate attention to limiting the number of animals involved?

Does the envisioned experimental procedure indicate that all reasonable precautions will be taken to prevent undue suffering by animals?

The NIH expects applicant investigators and institutional officials, peer review group members, and its own staff to be sensitive continually to these and related questions and to screen out inappropriate protocols, defective experimental designs, and other inadequately justified research plans. We believe our efforts in this area have been consistently effective.

The key element by far in this filtering process is the peer review system. All requests for NIH research funds undergo rigorous scrutiny by groups of mostly nongovernmental scientists expert in the appropriate subject matter areas. Peer reviewers receive specific instructions regarding the minimum set of questions they should address for those projects involving animals. Moreover, each review group almost invariably includes several individuals with firsthand experience in the techniques and procedures proposed. The range and depth of expertise routinely available in these peer review panels is far beyond anything that one could reasonably expect to find among the administrative staffs of research agencies or in animal care committees operated by awardee institutions.

Our current grant application procedures and peer review processes help us identify real or potential problems with proposed uses of experimental animals and trigger appropriate followup by the Office for Protection From Research Risks. However, this aspect of the documentation of peer review is not as detailed and predictable as it might be. For example, although perceived improprieties or protocol deficiencies are almost certain to be identified in review documents they are not always described in the same format or in the same location within the overall record. Furthermore, applicants' plans for animal use that are adjudged satisfactory by peer reviewers sometimes are not noted explicitly, even though the topic was addressed specifically during the review group's meeting. Our records in the aggregate therefore tend to understate the degree to which applicant investigators and peer reviewers seek to insure the proper use of experimental animals. We believe that improvements in this aspect of our system of documentation not only would be a further aid to our management but also would be a means to demonstrate the quality and rigor of our efforts to prevent inappropriate or inefficient uses of laboratory animals. We plan to initiate these system changes in the near future.

REPLACEMENT OF ANIMALS IN BIOLOGICAL TESTING SITUATIONS

Biological tests of various kinds play an indispensable role in the improvement of medical methods and the protection of human health and safety. The development of new drugs and vaccines and the detection of toxic substances in the environment are two of many examples. Historically, such testing has relied almost exclusively on techniques involving intact laboratory animals, usually rodents. Dogs, cats, and nonhuman primates have been used also but in much smaller numbers.

The objective in virtually every case has been to capitalize upon the physiological similarities between these animals and humans to identify effects that one might expect to find in human populations without actually putting them at risk.

The bulk of biological testing is carried out by or in support of industrial organizations such as pharmaceutical manufacturers, chemical companies and cosmetics producers. Much of the testing is required by Federal regulations intended to protect public health and safety. Some testing is not required explicitly but is judged necessary by the manufacturers to meet their own product standards.

The NIH role in biological testing per se is minor compared wit our overall activities in basic and applied research. The nation toxicology program is a focal point within the Government for the testing of potentially toxic substances and for the development of new or improved testing methods. Other NIH components foster testing of potential drugs or vaccines in selected areas but at a level that is only a small fraction of that performed by commercial organizations. The NIH contribution is much more substantial with respect to the knowledge base for new testing methods. The national toxicology program is at the forefront of efforts to develop and use testing methods involving bacteria or other relatively simple organisms. The results of basic and applied research sponsored by esentially all NIH components are a major source of the concepts and other information from which new biological tests arise. In our experience the normal processes of scientific communication are highly effective in disseminating the results of NIH-sponsored research to those who make subsequent use of them in biological testing. It is particularly gratifying when these new tests are able to produce substantial savings in time, money, and the lives of animals.

With respect to those new laboratory techniques that might one day replace testing methods involving intact animals considerable progress is being made in several areas. For example, bacterial systems are being used increasingly to detect substances that might cause genetic damage in humans and animals. Similarly, nerve cell cultures and invertebrate organisms offer hope for powerful and efficient means not only to detect agents that cause abnormal development of the nervous system but also to understand the mechanisms by which the abnormalities come about. And the rapidly expanding fields of cellular and genetic engineering are certain to bring about unprecedented improvements in the ways diagnostic and therapeutic substances are produced and evaluated.

But the promise unfortunately is not uniform across the spectrum of biological science. There is little reason to expect that the use of tumor-bearing animals in cancer drug development could be discontinued responsibly in the foreseeable future, to cite but one illustration. Nor is it likely that the toxic effects of radiation will be understood without continued reliance on experimentation with intact animals. Scientists and laypersons who seek nonanimal testing methods have to strive continuously to keep their hopes and expectations in tune with biological reality. The extraordinary complexity of living systems and our woefully incomplete understanding of them cannot help but attenuate our ambitions.

Last winter at the request of Congressman George E. Brown, Jr., the former chairman of this subcommittee, the NIH conducted a national symposium on biological testing. The meeting highlighted the state of the art in selected areas and identified some important research opportunities. Copies of a summary report of the symposium have been distributed widely. Copies of the full proceedings have been made available to the subcommittee and soon will be sent to all those who requested them.

A major result of the symposium was the identification of the need for a Government-wide forum to deal with biological testing. This forum would bring together on a regular basis representatives of research agencies, regulatory agencies, industrial organizations, animal welfare organizations, and other groups such as labor unions and consumer protection organizations. The objective would be to deal with selected regulatory requirements for biological testing and explore such questions as:

Are some current regulatory requirements unnecessary?

Are there ways to eliminate redundant requirements or otherwise reduce the volume of testing, especially where intact animals are involved?

Are there refinements to current testing protocols that would make them less time consuming, more reliable, and/or less noxious to animals?

Are there nonanimal methods available or on the scientific horizon that could eventually substitute for the animal-based procedures?

During the last several months I have participated in a series of discussions of this concept with the staff of the Office of Science and Technology Policy. The NIH could not appropriately establish or operate such a forum on its own but would welcome the opportunity to participate and have such additional means to help insure that the products of its basic and applied research find use wherever appropriate by regulatory agencies and the organizations with whom they deal.

ADJUNCTS TO LABORATORY ANIMAL EXPERIMENTATION

In contrast to the realm of biological testing, where substitution of nonanimal methods for animal methods is at least a theoretical possibility, the rest of biomedical science offers few such opportunities. The objective of any particular basic or applied research project generally dictates closely the experimental system that is needed. To the extent that the knowledge being sought deals with cellular or molecular phenomena, the likelihood of substantial animal use is low. Conversely, to the extent that the hypothesis being explored involves the integrated functions of an intact higher organism or the interaction of organ systems, animal experimentation is inevitable. Scientists typically are free to choose among many alternative research questions in their individual spheres of interest; but nature rarely allows wide latitude with respect to how any particular scientific question might be successfully approached.

Notwithstanding the limitations inherent in biology, research techniques are emerging that promise to simplify animal experimentation or to make it more efficient. An example of the first case is nuclear magnetic resonance, which offers the hope of new noninvasive means to visualize internal structures of humans and animals. An example of the second case is biomathematical modeling, which presents a potential means to reduce the number of animals required for particular studies by sharpening the focus of research plans. At present these and other nonbiological techniques still are in their infancy insofar as their biomedical uses are concerned, and in the near future their refinement and verification in specific projects are likely to generate more animal experimentation than they eliminate. Nevertheless these are worthy areas of inquiry and can be expected to draw increased attention.

The programs of the NIH have been important contributors to the entry of these physical science and mathematical techniques into the biomedical milieu. Illustrative examples of such work are included in the report of the NIH symposium that I mentioned earlier. The NIH will continue to welcome high-quality research proposals in these areas and will be alert to opportunities to help disseminate the results. The possibility that these techniques might one day reduce the need for animal studies as well as improve human health makes them doubly attractive. That the payoff is likely to be a long term rather than immediate one is no reason to eschew modest investment.

Mr. Chairman, I hope these summary comments have been helpful. I will be pleased to respond to any questions from the subcommittee as best I can.

Mr. **Walgren**. Thank you very much, Dr. Raub, and I assume that the two gentlemen with you are in support and have no formal statements to make.

Dr. **Raub**. That is correct, sir.

Mr. **Walgren**. Could I ask at the outset that NIH make available any documents that you have approving the research related to these particular primates at the Silver Spring laboratory be submitted to the committee to be made part of the record.

Dr. **Raub**. We will be pleased to do that, sir.

Mr. **Walgren**. And secondly, without objection, the report by the NIH evaluation team that resulted in the withdrawal of funding from this particular laboratory, which has been submitted to this committee, will also be made part of the record at this point.

[The information follows:]

SUMMARY STATEMENT
(Privileged Communication)

6101

Application Number: ~~1~~ 9 R01 ~~MH16954~~ NS 16685-08A1

Dual Review: NS

BR-N

Review Group: BASIC PSYCHOPHARMACOL. & NEUROPSYCHOL. RES. REV. COMM. (B)

Meeting Date: OCT. 18-19, 1979

Investigator: TAUB, EDWARD

Degree: PHD

Position: CHIEF, BEHAVIORAL BIOLOGY CENTER

Organization: INSTITUTE FOR BEHAVIORAL RESEARCH

City, State: SILVER SPRING, MD

Requested Start Date: 04/01/80

Project Title: EFFECTS OF SOMATOSENSORY DEAFFERENTATION

Recommendation: APPROVAL

FINAL ACTION:
NANCDS COUNCIL
January 1980
CONCURRENCE WITH STUDY SECTION ACTION

Priority Score: 215

Special Note: NO HUMAN SUBJECTS

PROJECT YEAR	DIRECT COSTS REQUESTED	DIRECT COSTS RECOMMENDED	PREVIOUSLY RECOMMENDED	GRANT PERIOD
08A1	115,624	~~68,357~~ 85997		
09	116,387	~~73,142~~ 90952		
10	117,031			

RESUME: This is a revised renewal application to continue the investigation of the loss of somatosensory information that results from section of the sensory roots innervating the forelimbs of monkeys. One group of studies will quantitatively define the resulting motor deficit; another group will seek to show that recovery of function is due to axonal sprouting from decending corticofugal systems that substitutes for the normal input from the periphery. The Committee judged that, at this stage, the anatomical studies were the more important and that they should be carried out expeditiously. The recommendation was for full support of this part of the proposal for up to two years, but not for extension of the behavioral work.

HUMAN SUBJECTS: There are no human subjects involved in the proposed research.

DESCRIPTION: The present project will attempt to define quantitatively the deficit in movement following forelimb deafferentation in monkeys. A further aim is to determine what neural restitutive mechanisms make it possible for such animals to make effective use of the deafferented limbs.

The behavioral work represents a continuation and refinement of experiments already in progress. One study will investigate prehension, i.e., fine movements of distal musculature in forelimb-deafferented monkeys. Task difficulty will be varied by requiring the animal to retrieve food objects from wells of different diameters and depths and by varying the distance of the food well from the animal. The purpose here is to examine the precision of movement of the deafferented animal and the degree of coordination in distal and proximal musculature. Reaching behavior will be studied in tasks that measure the limb trajectory and the ability of the animal to retrieve objects through tubes of various diameters, a task requiring shoulder and elbow manipulation. A variation will require the animal to reach through a tube and flex the elbow or wrist to reach a displaced object. Another investigation of the manipulative ability of the deafferented animals will require the monkeys to rotate a knob in order to gain access to food. The ambulatory ability of unilaterally and bilaterally deafferented monkeys will be studied in a runway task recently developed. The animals are driven down a 37 ft. long chamber, the floor of which is covered with a sheet of paper. The animals' paws are coated with dye so that paw prints mark the traverse of the animals as they move down the runway at various speeds. A computer system for encoding the location of the paw prints at short intervals has been developed. Temporal measures of movement will be obtained through video-tape recordings. A measure of general coordination will be obtained through the use of a task requiring the animal to cross horizontal ladders or to laterally traverse a vertical mesh suspended between two platforms. Speed and accuracy of movement will be the dependent variables.

The anatomical studies include degeneration studies of axonal sprouting in animals that have been deafferented and survived for at least 18 months. The principal investigator states that 10 such animals are available for immediate implementation of these studies. Two methods will be employed to demonstrate whether sprouting has occurred. The hypothesis emphasizes the role of cortico-spinal projections; therefore, six animals that have been unilaterally deafferented will receive multiple bilateral injections of tritiated leucine and proline in cortical area 4 (motor cortex) and areas 3, 1, and 2 (somatosensory cortex). The projection of these cortical areas to the dorsal column nuclei and the spinal cord will be mapped by autoradiography. The four remaining unilaterally deafferented monkeys will have these same cortical areas removed bilaterally. Silver degeneration techniques will be used to determine the projections of these cortical areas. Axonal sprouting in both the autoradiography and silver degeneration materials should appear as a bilateral asymmetry of terminals. Comparisons between the autoradiography and degeneration data will serve as cross checks for artifacts. Subsequent studies will involve combined cortical ablation and partial deafferentation.

CRITIQUE: The last proposal from this investigator and his co-workers was approved but not funded. The behavioral experiments in the present proposal are essentially the same as four of the six studies outlined previously. At that time, the behavioral work was judged as the main strength of that application. In the revised version, the principal investigator states the six studies were much more extensive than could be accomplished in the three-year project period. He is confident of "substantial progress" but not of completion within the next three years of the four studies retained. The new and more explicit picture of the cost in time, money, and animals for the project seems to require a new cost/benefit analysis.

Dr. Taub has already made a convincing case that monkeys are capable of making much greater use of deafferented limbs than was thought possible before his own work. His new aim is to concentrate on the remaining deficit (that is, what is lost). Yet the shift in emphasis from the monkeys' capabilities to their deficits may be more semantic than substantive, since the inventory of what is lost is in part outlined by what is preserved or regained. His effort to develop a quantitative index of what is lost may actually not be an improvement over a concise clinical description. For example, what will it mean to say that the ability of a monkey with a deafferented forelimb to reach into a cup of a certain depth is impaired? It would be more useful to know if the strength of individual fingers is reduced, or if the accuracy of opposing the fingers is lessened. To "quantify" the goodness of an act as a whole is not as illuminating as a close consideration of its component parts. There is little discussion of work on feedback in other motor systems, e.g., oculomotor or vestibular, that might provide some insights. A wide variety of preparations are used and proposed which are not clearly interlocked or logically related in ways that will permit clear answers to be obtained to some of the important questions raised. Despite the lengthy description, the reader is left to discover why particular experiments are being proposed; sometimes only a one-line rationale is given before plunging into the procedural details.

The anatomical aspects of the work are extremely important, both in terms of verification of deafferentation and discovery of possible recovery mechanisms. The present application contains a description of all proposed studies outlined in the original version; however, much of that work will be deferred until successful completion of the primary investigation of axonal sprouting of corticospinol systems. In the past, these investigators have expressed reservations about the utility of autoradiography for their purposes. The basic concern was that asymmetry in the terminal fields, visualized following injections of radio-labeled amino acids in the cortex, might be complicated by asymmetries in injection and uptake at the cortical sites. In the revised application, they plan to deal with this complication by using cortical ablation and silver degeneration techniques in about half the animals. It is doubtful that this will provide a completely satisfactory solution to the problem. The use of cortical ablations will not avoid the problem of asymmetry in definition of the boundaries of involved cortical areas. Moreover, silver degeneration methods and autoradiography differ in a number of respects that would make comparison between the two sets of data most difficult. Autoradiography data have been compared with results using silver degeneration in anatomical studies of a number of areas of the brain and spinal cord. These comparisons generally suggest that autoradiographic methods may be the more sensitive. Also, the problem of axonal debris mentioned in the original application, which persists for as long as 13 months following deafferentation, remains as a potential problem for the degeneration techniques.

The present application places more emphasis than did the original on "suprasegmental influences." Whereas the study of radioactive substances injected into motor and sensory areas then seemed to be a supplemental study at relatively little extra cost, taking advantage of a unique set of animals, in the new version it involves additional cost and time. Although the investigators are of course right in saying that it is not possible for them to show that sprouting causes the recovery, evidence from the ten monkeys now available might establish the degree to which axonal sprouting occurs in the primate central nervous system, whether it is similar to that in cats, and whether its extent is related to the extent of deaffrentation. It appears doubtful that an additional 18 to 24 monkeys would add more. The anatomical work has been proceeding at a slow pace at least partly because it is being done at another institution by the co-investigator, Dr. Goldberger, who devotes only 20% of his time to this project.

To encourage completion of the present phase of the work and to obtain a definitive answer on the question of sprouting, the Committee recommended approval with a reduction in time to two years and funding only for the anatomical subcontract, the salaries of Dr. Taub and Mr. Barro, and maintenance of the monkeys.

INVESTIGATORS: The principal investigator is Chief of the Behavioral Biology Center at the Institute for Behavioral Research in Silver Spring, Maryland. He received his Ph.D. in psychology from New York University in 1969. He has published extensively on the effects of deafferentation for over two decades. The co-investigator, Dr. Michael Goldberger, is Associate Professor of Anatomy at the Medical College of Pennsylvania. He received his Ph.D. in anatomy from the University of Pennsylvania in 1965. He is well-known for his careful work on sprouting in the spinal cord of cats following deafferentation.

RESOURCES AND ENVIRONMENT: The facilities for the behavioral work have been built up over many years and are excellent. As discussed in the critique, however, the anatomical work remains as a minor effort of the co-investigator at a different institution. Considering the importance of this work, the type of collaborative arrangement proposed is not optimal.

BUDGET: Support for two years, with inclusion of the anatomical subcontract, salaries of the principal investigator and his long-time associate, Gilbert Barro, and maintenance costs for the monkeys, was recommended.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
National Institutes of Health

Memorandum

Date October 7, 1981

From Director, Office for Protection from Research Risks

Subject Report on the Allegations of Noncompliance with Public Health Service Policy Governing the Care of Laboratory Animals at the Institute for Behavioral Research

To Associate Director for Extramural Research and Training

In response to your directive of September 16, 1981, this office established a committee whose members were selected in collaboration with the Acting Directors of the National Institute of Neurological and Communicative Disorders and Stroke, and the Division of Research Resources. The Committee was instructed to investigate the allegations of noncompliance and forward their report to me.

Attached is the Report and Recommendations of the NIH Committee to Investigate Alleged Animal Care Violations at the Institute for Behavioral Research. Drs. Taub and Rioch were given 24 hours, as previously agreed to by Dr. Taub, to review and comment on the Report. However, Dr. Taub requested an extension of this period because his laboratory records were still being held by Maryland authorities. Although Dr. Taub's request for an extension was not granted it was agreed that he may submit additional comments for the record at such time as his laboratory records are returned and he prepares a final response. Dr. Taub's cooperation in this matter is appreciated and his preliminary response to the Report is attached at Tab K.

The Office for Protection from Research Risks (OPRR) has reviewed both the Report and Dr. Taub's preliminary response, concurs with the recommendations of the Committee and encourages you to review the report and advise the Acting Director, NIH, as to further action.

In addition to our concurrence with the recommendations of the NIH Committee, OPRR requests that you give favorable consideration to the following action:

> *All NIH funding to the Institute for Behavioral Research for research involving laboratory animals be suspended, except for those funds necessary for the care and maintenance of animals involved in NIH-funded projects. This suspension should be effective immediately and continue until such time as the OPRR receives and approves an acceptable Animal Care Assurance from the Institute for Behavioral Research.*

I would like to express my appreciation to the members of the NIH Committee. Their effective handling of this matter, constrained as they were by the necessarily short time allowed to them, can only be judged outstanding.

Charles R. McCarthy
Charles R. McCarthy, Ph.D.

Attachment

cc: Members of the NIH Committee to Investigate Alleged Animal Care
  Violations at the Institute for Behavioral Research
  Dr. Goldstein
  Dr. O'Donnell

Report and Recommendations of the NIH Committee
to Investigate Alleged Animal Care Violations
at the Institute for Behavioral Research

I. Summary

A. Through news media reports on September 11, 1981, the National Institutes of Health (NIH) became aware of alleged violations of Public Health Service (PHS) policy regarding the care and use of laboratory animals and maintenance of the facilities in which they are housed. On that day seventeen monkeys and relevant research records were seized from the Silver Spring, Maryland laboratory of the Institute for Behavioral Research (IBR). The seizure was conducted by the Montgomery County Police operating under a warrant issued by Judge John McAuliffe, based on affidavits of five scientists who, at the invitation of a volunteer employee of IBR, had visited and assessed the conditions of the IBR's Silver Spring laboratory facilities and the monkeys housed there. It has since been ascertained that the monkeys were being used for studies funded by NIH.

B. On September 14, the Office for Protection from Research Risks (OPRR) was directed by Dr. William Raub, Associate Director for Extramural Research and Training, to conduct an inquiry into the allegations and events which resulted in the seizure. Dr. Raub charged OPRR with responsibility to determine as far as possible whether the IBR failed to comply with the applicable regulations and guidelines governing the care of laboratory animals and, if so, the nature and extent of the noncompliance.

C. On September 15, the Director, OPRR directed Mr. F. William Dommel, Jr., Assistant Director, OPRR, to establish and chair a committee whose members would be selected in collaboration with the Acting Directors of the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) and the Division of Research Resources (DRR). The committee would have responsibility to review the incident, conduct a site-visit of the IBR Silver Spring laboratory and prepare a report.

D. The NIH Committee received the full cooperation of the Montgomery County Police Department and the Office of the State's Attorney, enabling the Committee to review the state's evidence on September 21.

E. The NIH Committee received the full cooperation of the IBR, the IBR Animal Care Committee, and the Principal Investigator responsible for the proper care and treatment of the animals, Dr. Edward Taub, enabling the NIH Committee to conduct open and informative interviews with the IBR associates and inspection of the IBR laboratory facilities on September 21.

F. The NIH Committee did not attempt to evaluate the scientific merit of the IBR activities or attempt to assess the progress of the study. These evaluations and assessments have been and will continue to be made by appropriate review bodies. This Committee restricted its objective to ascertaining the IBR's compliance or noncompliance with the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals.

G. Based upon the NIH Committee's review of relevant PHS grant and assurance requirements and documents, interviews with the IBR Principal Investigators and members of the IBR Animal Care Committee, examination of the IBR laboratory facilities, and review of pictorial and documentary evidence provided by Maryland officials, the NIH Committee determined that IBR failed to comply with the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals in the following respects:

1. Adequate veterinary care is not provided.

2. The Animal Care Committee is not properly constituted and fails to provide adequate oversight of the facilities and the IBR's procedures for the care and use of the animals.

3. The physical facilities for housing the monkeys are inadequate.

4. The occupational health program for IBR staff is inadequate.

5. The condition of the laboratory on September 11 (as depicted in police photographs) was grossly unsanitary.

H. Based upon its findings the NIH Committee makes the following recommendations.

1. *The IBR without delay obtain the services of a Doctor or Doctors of Veterinary Medicine with experience in the care and treatment of laboratory primates and that the veterinarian(s) provide regularly scheduled care with a frequency deemed appropriate by the OPRR and in strict compliance with both the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals.*

2. *The IBR without delay reconstitute the IBR Animal Care Committee in strict compliance with both the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals and that the Doctor or Doctors of Veterinary Medicine referred to in recommendation #1 be included in the membership of the Animal Care Committee.*

3. *The IBR acquire adequate moveable replacement cages of stainless steel or other material which can and will be regularly sanitized outside of the monkey colony room; acquire and use standard attached feed containers in the monkey cages; provide protective covers for the lights in the monkey colony room; maintain a clean and orderly surgery room to be used solely for performing aseptic surgical procedures; develop an efficient ventilation system with separate circulation of the human and animal rooms.*

4. *The IBR without delay develop and implement a formally documented employee occupational health program in strict compliance with the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals.*

5. *The OPRR withdraw the current Animal Care Assurance approved for the IBR and renegotiate a new assurance, the approval of which will require evidence that the recommendations of this Committee are and will continue to be met, in letter, spirit and purpose in order to avoid reoccurrence of the compliance failures identified by this Committee.*

II. Background Information*

A. The IBR is currently the recipient of an NIH grant entitled "Effects of Somatosensory Deafferentation" funded by the NINCDS. This grant, NS16685, is in its ninth year of funding. Dr. Edward Taub is the Principal Investigator in this study, which is intended, through behavioral and anatomical studies, to define quantitatively the deficit in movement following forelimb deafferentation in monkeys. The behavioral aspect of the study is intended to investigate adaptive behavior in monkeys forced to use forelimbs in which sensation has been abolished. The anatomical aspect includes regeneration studies of axonal sprouting in animals that have been deafferented for at least 18 months. While the first seven years of the study were funded by the National Institute of Mental Health (NIMH), support of the research was subsequently provided by the NINCDS which has supported the project for the current two-year period. The total amount awarded by NINCDS for the first year was $106,864 and for the second (current) year, $115,068. The approved budget period ends March 31, 1982.

B. The IBR is also currently in receipt of a Biomedical Research Support Grant of $13,482 from the DRR. This grant, RR05636, is in its 15th year of funding and Dr. David Rioch is the Program Director. Although none of the funds for this grant were used to support the monkey colony at the IBR in FY 1980, $7,016 in FY 1979 funds did support the colony. Reports as to the disposition of the FY 1981 funds are not required to be filed by the IBR until 90 days following the budget period ending March 31, 1982.

C. Recipients of PHS grants which involve the use of animals in research are required to comply with the PHS Animal Welfare Policy and the NIH Guide for the Care and Use of Laboratory Animals (Guide) (Tab B). The PHS Policy requires an institution to:

1. negotiate an assurance with OPRR that it is committed to comply with the principles set forth in the PHS Policy, the Guide, the provisions of the Animal Welfare Acts, and other applicable laws and regulations;
2. establish a mechanism to review its animal facilities for conformance with the provisions of the Guide;
3. report immediately to OPRR any changes in assurance status or problems encountered in implementing PHS policy;
4. unless the animal facilities are accredited by the American Association for Accreditation of Laboratory Animal Care (AAALAC), establish a committee to review procedures for the care and use of animals. The committee should consist of at least five members and include one veterinarian with training or experience in laboratory animal medicine to provide adequate veterinary care at the institution; and

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*Also see Tab A - Chronology

5. maintain records, available for inspection by authorized PHS officials, of committee activities, including recommendations and determinations.

Additionally, facilities which maintain animals must comply with applicable USDA regulations (9 CFR Subchapter A, parts 1-3) and are subject to USDA inspections (Tab C).

D. IBR has an assurance on file with OPRR dated April 26, 1979, which states that IBR accepts responsibility for humane care and use of animals in NIH-funded projects, and is committed to comply with PHS Policy, the Guide, the Animal Welfare Acts, and other applicable laws and regulations. The assurance also names a five member Animal Care Committee which is responsible for annual inspections of IBR facilities for compliance with the Guide. Also on file with OPRR are minutes of the November, 1980 meeting of the Animal Care Committee. These minutes indicate that there were nineteen primates which were healthy, active, and in good condition, and that the use, maintenance and care of the animals was fully acceptable, humane and met all of the requirements of the Guide. The minutes also indicate that one individual had left the institution and was no longer a member of the committee. (Tab D)

E. On the morning of Friday, September 11, 1981, the Montgomery County Police, under the direction of Sergeant Swain, entered the IBR Silver Spring laboratory and seized 17 research monkeys and related records, as authorized by a warrant signed by Judge John McAuliffe apparently issued on evidence of violations of the Maryland Annotated Code Article 27, Section 59. After the monkeys were removed from the laboratory a police photographer took approximately 175 black and white photographs of the facility.

Later in the day Dr. O'Donnell, Acting Director, DRR, was alerted by ABC television newsman Roger Karas of the raid at the IBR Silver Spring facility. The Associate Director for Extramural Research and Training (ADERT), the NINCDS, and the OPRR were all notified and consulted (Tab E).

F. On September 14, Dr. Raub (ADERT) directed the OPRR to conduct an inquiry into the allegations and events which apparently resulted in the police raid, and to determine whether the IBR failed to comply with the applicable regulations and guidelines governing the care of laboratory animals and, if so, the nature and extent of the noncompliance (Tab E). In order to assist in the investigation, the OPRR organized a committee to examine evidence to be made available by Maryland officials and to conduct a site visit and interviews at the IBR laboratory. The NIH Committee was comprised of the following individuals:

F. William Dommel, Jr., J.D., Chairman
Assistant Director
Office for Protection from Research Risks
Office of the Director
National Institutes of Health
Department of Health and Human Services

Marc Bruno
Staff Assistant
Office for Protection from Research Risks
Office of the Director
National Institutes of Health
Department of Health and Human Services

Helen Gordon
Regional Assistant
Office for Protection from Research Risks
Office of the Director
National Institutes of Health
Department of Health and Human Services

John Holman, D.V.M., Ph.D.
Program Director
Laboratory Animal Sciences Program
Division of Research Resources
National Institutes of Health
Department of Health and Human Services

William Pitlick, Ph.D.
Acting Deputy Director
Neurological Disorders Program
National Institute of Neurological and Communicative
  Disorders and Stroke
National Institutes of Health
Department of Health and Human Services

William H. Pryor, Jr., D.V.M.
Director, Animal Resources Center
School of Medicine
East Carolina University
Greenville, North Carolina 27834

Shelley Steuer, J.D.
Attorney Advisor
National Institutes of Health Branch
Public Health Service Division
Office of the General Counsel
Department of Health and Human Services

James B. Veltri
Auditor
Division of Management Survey and Review
Office of the Director
National Institutes of Health
Department of Health and Human Services

Carol Young, Recording Secretary
Staff Assistant
Office for Protection from Research Risks
Office of the Director
National Institutes of Health
Department of Health and Human Services

III. Review of Materials Received from Maryland Officials

On September 19, Mr. Dommel and two members of the OPRR staff met, at the request of NIH, with Sergeant Swain of the Montgomery County Police and Maryland Assistant State's Attorney Fitzpatrick to discuss the incident involving 17 research monkeys at the Institute for Behavioral Research laboratory on Brookville Road in Silver Spring, Maryland. Sergeant Swain presented a written request under the Freedom of Information Act to Mr. Dommel for "application information, award information, and review summaries for active NIH grants to the Institute for Behavioral Research" in order to assist the Mongomery County Police in an official criminal investigation. Mr. Dommel provided the requested information. Sergeant Swain, who directed the raid at the Silver Spring facility, presented Mr. Dommel with the affidavits of five scientists who at the invitation of a volunteer employee of IBR, visited and assessed the conditions of the IBR laboratory facilities and the monkeys housed there (Tab F). Sergeant Swain described the condition of the IBR laboratory at the time of the raid and provided Mr. Dommel with 117 black and white photographs which were taken during the raid (Tab G). He assured Mr. Dommel that the laboratory conditions, as depicted in the photographs, were (with only a few exceptions) exactly as the police found them and not a result of the raid. Sergeant Swain also presented to Mr. Dommel a summary report on the physical condition of the monkeys which were examined on September 17, by Janis Ott, D.V.M., Veterinarian-in-charge, Brookfield Zoo, Brookfield, Illinois, and Phillip T. Robinson, D.V.M., Director of Veterinary Services, San Diego Zoo, San Diego, California (Tab H). Mr. Fitzpatrick provided Mr. Dommel with a copy of sections of the Maryland Annotated Code which Dr. Taub allegedly violated (Tab I).

On September 21, prior to the official site-visit, the NIH Committee met and reviewed the materials provided by the Maryland officials and made the following observations:

A. The photographs taken by the Montgomery County Police the day of the raid depict a laboratory which was unsanitary and in considerable disarray. Several areas of the laboratory, including cabinets and drawers containing medicines and medical supplies, appeared to be in a state of disorganization. Laboratory supplies were strewn about on counters and floors. Rodent feces appeared in drawers, cabinets and on the floor as well as in the catch pans of the cages. Some of the monkey cage wiring was broken and the broken wires were protruding into the cages, and the cages were unclean as evidenced by dirt, rust particles, soiled and discarded bandages, and accumulations of fecal material. In general, the condition of the laboratory on September 11, 1981, appeared to be disheveled beyond any reasonable standard of acceptable untidiness which might be expected to exist in a busy laboratory.

B. The five affidavits were signed by professional scientists experienced in either animal/primate research or primate behavior. Each had separately visited the IBR Silver Spring lab accompanied by Mr. Alex Pacheco, a volunteer worker at the IBR. All five affidavits noted that the conditions of the laboratory during their visit were extremely filthy and accumulations of dirt and feces were evident on cage surfaces and in the catch pans of the cages in the monkey colony room. Several commented that the stench was exceptionally foul, even for a primate laboratory, and there was not adequate ventilation. Four of the scientists commented that the timing device which regulates light in the monkey colony room was broken, causing the monkeys to live in an environment with constant light. All of the affidavits noted that the animals appeared unhealthy, and evidenced a lack of veterinary care. Three of the affidavits noted rodent feces in the monkey colony room and in other areas of the laboratory. It was also noted that there was nothing in the cages for the monkeys to manipulate, sharp wires were protruding into some of the cages, and feed bowls were not provided, causing the food (monkey biscuits) to fall through the cages into the catch pans with fecal material. In general, the affidavits cited unnecessary suffering of the animals due to deprivation of basic physical and psychological needs.

C. The reports on the examinations of the monkeys, submitted by Drs. Ott and Robinson, indicate a number of conditions that would have required veterinary care. The medical report classifies the monkeys into two categories: seven "non-surgical animals" and ten "surgically treated animals." The non-surgical animals appeared to be in normal physical condition with the exception of the female rhesus who was judged to be underweight and requiring further x-ray examination of the left foot and ankle. Of the ten surgically treated animals, six were further diagnosed as requiring minor or no veterinary treatment and four as requiring immediate veterinary treatment. Of those requiring minor or no treatment, two animals had bony callus of the bones of the forearm suggestive of previous fracture. Of those animals requiring immediate veterinary treatment, one had a draining hand lesion indicating possible osteomyelitis, one had two draining, purulent holes in the upper left arm requiring corrective treatment or skin grafting, and another had a fractured canine tooth. All of the deafferented monkeys had either missing or deformed digits.

It was the opinion of Drs. Ott and Robinson that the veterinary care available to animals sustaining injuries to deafferented limbs was not sufficient to meet their medical needs and that the medical care in general provided for this colony was inadequate.

IV. THE NIH COMMITTEE's SITE-VISIT OF THE IBR SILVER SPRING FACILITY

Part 1, The Committee Interview of the IBR Associates

A. On Monday, September 21, the NIH Committee visited the Silver Spring laboratory of IBR. The IBR associates presented the NIH Committee with copies of the following documents at the facility:

1. a legal memorandum dated September 17, 1981, to the Circuit Court of Maryland requesting immediate return of the facility's research animals and records which were seized by the Montgomery County Police;
2. three USDA inspection forms dated July 13, September 15 and September 17, 1981;
3. a notice from the Animal Law Enforcement Association, dated September 15, 1981, informing Dr. Taub of the seizure of his research monkeys, and of his right to request their return within ten days of their removal under Article 27 of the Maryland Annotated Code;
4. relevant grant information relating to Dr. Taub's current, NINCDS-funded, project;
5. a newspaper article, dated February 26, 1978, describing some of the innovations of the animal research under the direction of Dr. Taub; and
6. a "Twentieth Year Report of IBR" dated 1980 describing the range of the biological and psychological research conducted by IBR and describing the corporate organization.

B. Before proceeding to an examination of the physical facility, the Committee conducted a three hour interview with the following IBR associates:

1. Edward Taub, Ph.D., Principal Investigator of the NINCDS grant "Effects of Somatosensory Deafferentation", member of the Animal Care Committee of IBR, and Administrative Director of the Behavioral Biology Center;
2. David Rioch, M.D., Program Director of the DRR Biomedical Research Support Grant, Chairman of the Animal Care Committee, and Director of IBR's Behavioral and Biomedical Science Support Services;
3. Solomon Steiner, Ph.D., member of the Animal Care Committee, former collaborator with Dr. Taub on deafferentation research, and Director of the IBR's research facility at the City College of New York;
4. Paul Hildebrandt, D.V.M., member of the Animal Care Committee, consulting veterinarian of the IBR Silver Spring laboratory, and not otherwise associated with the Institute; and
5. Joseph Vasapoli, Chief Executive Director of IBR.

C. Questions were not forwarded to Dr. Taub and his associates before the meeting. However, the participants impressed the NIH Committee as being forthright in their response to a wide range of questions, including those concerning:

1. the employment of Mr. Alex Pacheco;
2. that series of events subsequent to the July 13, 1981, USDA inspection of the facility which did not find any deficiencies;
3. the general administrative organization of the laboratory and of the deafferentation research;
4. the nature and extent of veterinary care at the laboratory; and
5. the nature and extent of the review process by the Animal Care Committee.

D. Dr. Taub discussed his employment of Mr. Pacheco as a laboratory volunteer. At the time of the employment in May 1981, Dr. Taub felt that Mr. Pacheco was truly interested in animal research as a possible career because of his willingness to volunteer his time to the IBR laboratory. Dr. Taub realized that Mr. Pacheco had minimal experience working with animals but thought that he could be entrusted with the watering, feeding, and cleaning of two monkeys--one deafferented and the other normal. Dr. Taub was quickly disappointed, he told the Committee, because Mr. Pacheco did not ask many questions, was frequently irresponsible towards the minimal tasks assigned, and seemed to have dropped his interest in the experiments conducted.

Mr. Pacheco was not forbidden from entering the monkey colony room and was, in fact, encouraged to observe all that went on there as part of his learning experience. Mr. Pacheco helped to do some sensory mapping* and was later asked to continue this procedure with his own deafferent monkey. Eventually Dr. Taub permitted Mr. Pacheco to conduct a pilot study of displacement behavior with the two monkeys for which he was responsible. This pilot study involved the offering and withdrawal of food, and observations of the animal's behavior in each situation. By suddenly depriving the animal of a single raisin after allowing the animal to reach and grab a raisin fifty times in rapid succession, Dr. Taub expected irate behavior, that is, displacement behavior, to result. However, Mr. Pacheco never completed this pilot study and never built up to that condition in which the two monkeys were ready for the fifty-first offering of the raisin. According to Dr. Taub, it was only this displacement behavior pilot study, or the sensory mapping of the deafferented animals, which Mr. Pacheco could have referred to as representative of the cruel treatment of the monkeys at the laboratory.

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*Sensory mapping is used to define the desensitized areas on the monkey, Dr. Taub explained, by applying low-voltage electrical stimuli to the monkey. Several IBR associates compared the technique to similar sensory mapping techniques used on humans.

Mr. Pacheco was, according to Dr. Taub, confused by the water and food mechanism in his two monkeys' cages, which were not part of the monkey colony room. However, Dr. Taub told the NIH Committee that constant observation of those two monkeys by two other laboratory assistants precluded the possibility that either monkey ever went without water or food due to Mr. Pacheco's lapses of responsibility.

Prior to the seizure of his research animals and records, Dr. Taub was unaware that Mr. Pacheco had photographed the animals in his absence, removed research photographs from the laboratory files, and invited five scientists to observe the condition of the facility and the animals. Dr. Taub also pointed out that Mr. Pacheco had never complained to him of the research procedures, the animals' health, or the conditions of the facility.

E. Dr. Taub explained that as Director of the Behavioral Biology Center, the control and maintenance of the monkeys and the facility and the conduct of experiments are ultimately his responsibility. However, he pointed out that Mr. John Kunz, a technician employed by the IBR, was responsible for the daily examination of the monkeys and the facility. Mr. Kunz, who was not present at the Committee interview, was supervisor of two student assistants, Mr. Bob Osborne and Mr. Ahmeyer Schwartz, who cleaned the floor and cages of the monkey colony room each evening in turn. According to Dr. Taub, Mr. Kunz was responsible for feeding the monkeys, conducting gross autopsy when necessary, making sure that bandages stayed in place, performing some sensory mapping examinations, and observing the monkeys and facility for sudden changes which might warrant action by Dr. Taub. Thus, the failure of the automatic lighting system at night, the degeneration of the maintenance of the facility during Dr. Taub's absence, and any failure on the part of the automatic watering system should have been reported by Mr. Kunz to Dr. Taub. However, in the case of the automatic lighting system, Dr. Taub explained to the NIH Committee that the malfunction was not discovered because laboratory personnel are not present during evening hours when the system was timed to turn off the lights.

F. In response to the questions of the NIH Committee and to those allegations raised in recent news articles, Dr. Taub admitted that the condition of the facility on the day of the search and seizure by the Montgomery County Police was very poor. He pointed out, however, that the poor condition of the facility was an exception and that the normally high standards met by the laboratory were evidenced by USDA inspections. USDA found minor deficiencies on several occasions beginning with the first inspection of the Silver Spring laboratory on January 13, 1978. These had, according to the USDA, all been corrected by July 13, 1981.

Moreover, Dr. Taub said that the conditions at the laboratory, particularly those of the monkey colony room, had degenerated since he had left the facility for vacation on August 21. Dr. Taub explained that the two individuals responsible for cleaning the facility failed to report to work on four occasions during his absence. He went on to say that although he had installed a telephone at his vacation retreat, in order to maintain contact with the Silver Spring laboratory, he was not informed of any problems during his absence and had not discovered the condition of the laboratory before the police raid. Thus, he assumed that everything was fine during this two-week period.

G. Drs. Taub and Hildebrandt were questioned about the nature and extent of veterinary care at the IBR facility. Dr. Hildebrandt is the only veterinarian associated with the laboratory, but his role is a minimal one. Dr. Hildebrandt explained to the NIH Committee that he has always considered his relationship with the laboratory as that of a consultant rather than a practicing veterinarian. He has not been involved in the approval or recommended use of medicines used by the laboratory and he was not asked to diagnose or review the treatment of either of the two animals which died unexpectedly during the past year. Dr. Hildebrandt spoke of this lack of involvement with respect to both his capacity as the single veterinarian on the Animal Care Committee and his capacity as the only veterinarian associated with the laboratory in any way. According to Dr. Taub the two animals that have died at the research facility during the past year were treated as the situation seemed to warrant at the time. He admits, however, that in neither case was a veterinarian consulted; in the first instance because the animal died so quickly after showing symptoms of illness and in the second instance because a decision was made to sacrifice the animal for research purposes. The first death was the result of sudden intestinal blockage, according to a gross autopsy performed by Mr. Kunz and observed by Dr. Taub. Few precautionary measures were taken when the monkey was first observed to be distressed, be suffering from severe dehydration and have deeply sunken eye sockets. In response, electrolytes were placed in the animal's water, and continued observation was planned for the following morning. Dr. Taub left the laboratory at his normal departure time the day the monkey was first observed to be sick. The following morning the monkey was found to be comatose.

The second death at the IBR facility occurred two months later. One of the deafferented animals that had undergone fetal deafferentation began developing paraplegia of the remaining useful limbs four years after the initial surgery. In response, Dr. Taub padded the walls of the monkey's cage in order to prevent unnecessary physical injury. However, the monkey's health deteriorated due to a urinary tract infection which did not respond to conventional antibiotic treatment. The monkey was then sacrificed for research purposes. However, according to Dr. Taub, its neurophysiology had not yet progressed to that point which would be helpful to the research protocol, and anatomical studies, therefore, were not conducted.

Drs. Taub and Hildebrandt were questioned about the general health of the IBR monkeys. Dr. Taub described the animals as "robust and in good health," with the exception of the two animals noted above. Dr. Hildebrandt likened the liveliness of the animals he observed on his annual visits to the laboratory to the liveliness of other research monkeys and exibition monkeys he had observed. He conceded that, as a pathologist, he had little experience with research animals of any sort, or with primates in or out of the laboratory.

Dr. Taub then told the NIH Committee that his laboratory animals had remained remarkably free from infectious diseases, including tuberculosis, and Dr. David Rioch, Chairman of the Animal Care Committee for the IBR grant, added that he had never before observed such a healthy colony of research monkeys. Dr. Taub explained to the NIH Committee that, in his opinion, it is unnecessary to conduct regular hematological or parasitological testing with such a healthy group of animals. With regard to regular weight tests of the animals, Dr. Taub assured the NIH Committee that such testing and general physical observations of the monkeys were carried out by his laboratory assistant, but conceded that comparative weight loss or gain records were not kept. Based on the general examinations, Dr. Taub believes the monkey colony to be free of parasites.

H. Dr. Taub was questioned about the occupational health system of the IBR laboratory. Dr. Taub responded that although an informal system for providing yearly tuberculosis testing of personnel had once been employed, the testing has been discontinued by the IBR laboratory. Furthermore, he felt it unnecessary to continue tuberculosis testing and an initial screening program for his laboratory assistants, since he has not recently employed assistants from those groups demographically predisposed to carry tuberculosis. No other regular health tests of personnel or vaccine programs for primate handlers were given by the IBR. Upon further questioning, Dr. Taub indicated that most aspects of such a program had not been considered.

I. The IBR associates present were then asked by the NIH Committee to explain their understanding of current PHS policy regarding the review by the in-house Animal Care Committee of animal research facilities and procedures. Drs. Rioch, Steiner, and Taub of the Animal Care Committee explained that medicines and anesthetics had not recently been discussed by the Animal Care Committee because no surgery had occurred at the IBR laboratory for two years. Analgesics had never been considered by their committee because analgesics are not required by any guide or professional standard of which they were aware. In their opinion, postoperative pain killers were unnecessary in surgical deafferentation, and those monkeys undergoing the operation rarely had any feeling in or around the affected limb immediately following surgery. Dr. Rioch stated his belief that applying human expectations of pain to animal surgery was inappropriate because pain is primarily a matter of societal conditioning to which animals are not subject.

There was a general consensus of those Animal Care Committee members present at the interview that Dr. Taub was the single member of the committee qualified enough in the care of deafferented primates to judge the procedures used in the care and treatment of such animals. Neither the IBR nor Dr. Taub established written guidelines for the Animal Care Committee to aid them in their yearly review of his research. Further, the Animal Care Committee did not provide Dr. Taub and his assistants with written guidelines which could serve to assist the researchers in maintaining compliance with the Guide.

The yearly inspection of the Silver Spring laboratory by the Animal Care Committee members consisted of a tour of the facility and discussions with the Principal Investigator about the nature of his work. Minutes were taken of their meeting. One member of the Animal Care Committee commented that he assumed that Dr. Taub's research facility and procedures were acceptable by all relevant legal and ethical standards because the laboratory was inspected twice yearly by USDA and because the NIH had approved the original research grant application.

J. In conclusion, Dr. Taub committed himself to changing those deficiencies of the Silver Spring laboratory noted by the USDA inspector on September 15, 1981. Indeed, a USDA inspection conducted September 17, 1981 indicated no unexplained deficiences. He expressed his feeling to the NIH Committee that he was the victim of larger political forces which had randomly chosen his laboratory in order to publicize their cause. He admitted to the Committee that recent management of the laboratory had evidently been inadequate, but believed that this was primarily due to a lack of communication caused by his absence and his animal caretaker's demure nature. He assured the Committee that closer personal monitoring of the laboratory would follow, and that new maintenance personnel would be hired for evening cleaning tasks.

Part 2, The Committee Inspection of the IBR Laboratory

K. No animals were present at the IBR facility at the time of the NIH Committee visit. Thus, only the physical layout and general condition of the recently cleaned laboratory could be observed during this inspection.

L. The monkey colony room consisted of six large and sixteen small cages for the seventeen monkeys housed at the facility. The extra cages allow the monkeys to be moved into unoccupied cages while their cages are being cleaned. The six large cages measure 36 inches deep, 33 inches wide, and 36 inches high; the small cages measure 36 inches deep, 17 inches wide, and 36 inches high. These measurements produce an adequate living space for the size monkeys being housed at the IBR laboratory, according to current USDA standards.

However, metal floor wire in four cages was found to be broken or bent resulting in sharp angles with the disjointed wires left pointing upward into the cages. Besides being dangerous to the monkeys and the animal caretakers, these prongs may effectively reduce the useable size of the cage, so that these four cages might actually fall below the minimal standards.

The feeding system appeared inadequate because of the lack of feed containers and poor cage construction. The floor mesh of the cages was large enough to allow monkey biscuits to fall through the cage floor onto the catch pans and mix with fecal matter. The watering system in the monkey colony room is automatic, and appeared adequate with the exception of one broken faucet.

The monkey cages were constructed of woven galvanized wire in a galvanized metal frame. The corners of the frame and joints between the cages were reinforced with epoxy-painted steel located far enough from the animals to prevent them from being affected by the paint. However, the galvanized coating was chipping off in many places on both the mesh and frame, inviting rust and general uncleanliness. A galvanized sheet metal tray beneath each cage is designed for catching feces and urine. Mineral deposits from fecal material, urine, and/or water were noted in places on these trays and particularly along the runners which support them below the cages. In addition, dirt, hair, rust, and chipped paint were evident in and around the catch trays.

The mesh construction of the cages, and frequent overlapping of two or more screens to strengthen a cage floor, made adequate cleaning of the monkey room cages seemingly impossible. Photographs of the room taken by Montgomery County Police at the time of their search and seizure of the facility indicated that the cages had not been cleaned for quite a while before the police raid (TAB G). Dr. Taub told the NIH Committee that on two separate occasions, for two days on each occasion, the colony room had been neglected by those responsible for its daily maintenance. According to Dr. Taub, that neglect was an abnormal condition probably resulting from his absence.

The monkey colony room lacked a comprehensive drainage system which might ameliorate those cleaning problems posed by the immobile structure of the cages noted above. Dr. Taub explained that long handled brushes are used to regularly clean the cages. However, such a method requires very frequent attention to the cages.

The monkey colony room was enclosed by four plasterboard walls, heavily painted. This is not a material easy to disinfect and maintain in a room which must be so frequently cleaned with water.

The monkey colony room is ventilated by use of an exhaust fan which draws air from the adjacent hallway through a hole in one wall. Dr. Taub assured the NIH Committee that hallway air had only come into the monkey room and had never been blown from the room into the hallway. Air is heated and cooled by a central unit located in the human occupancy spaces of the building. There is no further treatment of the air before it reaches the colony room. Since animals were not present at the time of the NIH Committee visit, evaluation of the effectiveness of the system in controlling odors and ammonia content in the air was not possible.

Lastly, the NIH Committee noted that the colony room contained exposed florescent ceiling bulbs, a potential danger to research animals and laboratory animal personnel were an animal to escape.

M. In addition to the conditions observed in the monkey colony room, the NIH Committee noted that a single common hallway led from the colony room to other sections of the laboratory, including the main entrance and office areas, and the histology, surgery, and other research oriented workrooms. The layout of the facilities necessitates a frequent interaction between those personnel and materials exposed to the monkeys on a regular basis and those not so exposed. Moreover, this arrangement further compromises the poor health standards resulting from the deficient ventilation system, as noted above.

N. The NIH Committee visited the other rooms of the laboratory which Dr. Taub felt most relevant to the Committee's concerns. It was explained that although the surgery room was in fact in a state of general disarray on the day of the police search and seizure, the room could be made ready for surgery with a day's notice. The surgery room had been rearranged and cleaned for the Committee's visit. Dr. Taub reminded the NIH Committee that no surgery had been performed at the facility for two years, nor had the histology room been used during that time.

The food storage room had been newly painted to meet the recent USDA inspection recommendations of September 15, 1981. All food bags in use had been moved to this well protected small room so as to discourage vermin infestation of the facility in general. Dr. Rioch explained to the NIH Committee that vermin infestation was a general problem in research laboratories using animals, and that the IBR facility had hired exterminators (later proven to NIH by IBR vouchers) on three different occasions, but none of the extermination attempts had been completely successful. Police photographs of the laboratory at the time of the raid indicated an extensive vermin problem at the facility.

Other work areas in the IBR facility appeared clean and acceptably organized. Those monkeys previously sacrificed and presently stored in Formalin for future surgical technical practicum were kept as far as possible from the occupied areas of the laboratory. Monkey restraining chairs shown in police photographs were shown to be professional scientific instruments, with some acceptable adaptations made in order to meet the needs of the research.

V. Findings and Recommendations of the NIH Committee

A. Based on the site-visit described above and evidence provided by the Maryland officials, the NIH Committee made the following findings and recommendations.

1. Adequate veterinary care has not been provided at the IBR facility. Dr. Hildebrandt, the IBR's veterinarian consultant, was not consulted on the use of medications or treatments for the monkeys even when two fatal illnesses occurred. He has, in fact, not visited the IBR laboratory other than to attend the annual meeting of the Animal Care Committee. It was clear from his responses to questions by the NIH Committee, that adequate veterinary care, as required by the Guide, was not provided. This lack of care is further evidenced by the examination report prepared by Drs. Ott and Robinson (Tab H). Therefore, the NIH Committee recommends that: *The IBR without delay obtain the services of a Doctor or Doctors of Veterinary Medicine with experience in the care and treatment of laboratory primates and that the veterinarian(s) provide regularly scheduled care with a frequency deemed appropriate by the OPRR and in strict compliance with both the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals.*

2. The Animal Care Committee was not properly constituted because it lacked the necessary expertise to provide the adequate oversight required by the Guide. The Animal Care Committee members present at the site-visit interview appeared unfamiliar with the substance of the Guide, with its underlying purpose, and with their review role as described by the assurance on file with the OPRR. In addition, Drs. Taub, and Rioch were not aware that the NIH had been notified that one member of their committee, Dr. Paul School, had left the Animal Care Committee and that no one had been appointed as a replacement, as required by the PHS Animal Welfare Policy. Therefore, the NIH Committee recommends that: *The IBR without delay reconstitute the IBR Animal Care Committee in strict compliance with both the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals. The Doctor or Doctors of Veterinary Medicine referred to in recommendation #1 should be included in the membership of the Animal Care Committee.*

3. Improvements of the existing laboratory facilities are necessary to meet the requirements of the PHS Animal Welfare Policy and the corresponding Guide. Therefore, the NIH Committee recommends that: *The IBR acquire adequate moveable cages of stainless steel or other material which can and will be regularly sanitized outside of the monkey colony room; acquire and use standard attached feed containers in the monkey cages; provide protective covers for the lights in the monkey colony room; maintain a clean and orderly surgery room to be used solely for performing aseptic surgical procedures; develop an efficient ventilation system with separate circulation of the human and animal rooms.*

4. The IBR does not maintain an adequate occupational health program in compliance with the PHS Animal Welfare Policy and the corresponding Guide. Therefore the NIH Committee recommends that: *The IBR without delay develop and implement a formally documented employee occupational health program in strict compliance with the PHS Animal Welfare Policy and the corresponding NIH Guide for the Care and Use of Laboratory Animals.*

5. Finally, the NIH Commitee found that assurance requirements notwithstanding, the IBR has failed to provide the high level of animal care and failed to maintain the adequate physical facilities at the IBR laboratory which are a prerequisite to NIH funding. Therefore, the NIH Committee recommends that: *The OPRR withdraw the current Animal Care Assurance approved for the IBR and renegotiate a new assurance, the approval of which will require evidence that the recommendations of this Committee are and will continue to be met, in letter, spirit and purpose in order to avoid reoccurrence of the compliance failures identified by this Committee.*

Signature Page

F. William Dommel
F. William Dommel, Jr., J.D., Chairman
Assistant Director, Office for Protection
from Research Risks, OD, NIH

Marc Bruno
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from Research Risks, OD, NIH

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of the General Counsel, HHS

James B. Veltri
James B. Veltri
Auditor, Division of Management Survey
and Review, OD, NIH

Carol Young
Carol Young, B.S., Recording Secretary
Staff Assistant, Office for Protection
from Research Risks, OD, NIH

Mr. **Walgren**. And then I would like to just ask the simple question: What went wrong here?

Dr. **Raub**. There is a long and, at the moment, incomplete answer to that question. The finding of the NIH inquiry, as indicated in the materials made available to the committee and then to the news media last week, was that there was a substantial failure on the part of the Institute for Behavioral Research to comply with the NIH guidelines and conditions associated with our awards.

The NIH had on file from the institution a written assurance to the effect that it would comply with the guidelines published by the NIH as well as the requirements of the Animal Welfare Act.

In our judgment, such was not the case, and we acted to suspend the funding.

Mr. **Walgren**. Separating NIH's involvement into two parts, one would be the part where you approve the experiment in the first place and provide the funding, and the second part would be your involvement, if any, in monitoring the conditions under which the experiment is carried out.

Thinking of the second part first, you operate on a written assurance from the facility; is that correct?

Dr. **Raub**. That is correct, sir.

Mr. **Walgren**. And I gather from your testimony that there are no site visits, at least up until this point, by NIH to establish the kind of a presence that a researcher would know someone might be coming to look at them. At present that does not exist?

Dr. **Raub**. There are no mandatory site visits by the NIH associated with the assurance itself. If we had any reason to believe, as was the case here, that there was apparent deviation from those assurances and our guidelines, then we would site-visit routinely. But there is no regular site-visiting process.

Mr. **Walgren**. Mr. Pacheco indicated that NIH was informed of some criticism of this laboratory in 1977. Did that warning raise any flags within the NIH that triggered any closer scrutiny of this particular facility than any others?

Dr. **Raub**. I have not been able to sort out all of the events over the last decade that have been referred to in various newspaper reports and other commentaries. To the best of my knowledge, there was a report of concern about some inadequate caging several years ago. That report was followed up on by one of our NIH funding units, including some promises from the institution that improvements would be made.

Mr. **Walgren**. Those promises were made in 1977?

Dr. **Raub**. I believe that is true, yes, sir.

Mr. **Walgren**. And is that part of your record of this project at NIH?

Dr. **Raub**. The record, as I understand it, is incomplete. To the best of my knowledge, the action was promised. I believe it was only fulfilled in part.

Mr. **Walgren**. On what do you base your knowledge that such action was promised?

Dr. **Raub**. I base it on some discussions with NIH staff members. In going back over the history of the particular grant in question, the NIH has been funding that project for the last several years. But prior to that the funding came from another part of the U.S.

Public Health Service. The NIH assumed funding responsibility for the award when the scientific research changed direction in a way that made it more NIH's mission than that of the National Institute of Mental Health.

The events that have been brought to my attention involved another NIH project no longer active, but that involved the same facility and nonhuman primates.

Mr. **Walgren**. Would you submit for the record the documentation NIH has of these promises that were made, particularly any evidence in writing that promises were made by this Institute in response to a warning sign that may have come to NIH's attention.

Dr. **Raub**. I will be pleased to do that, Mr. Chairman.

May I just add, Mr. Chairman, that as we have been able to uncover these pieces of the record, which are not directly part of this particular grant, that the nature of the incidents and the concerns were nowhere near the extent or the character as has been described in the recent events.

Mr. **Walgren**. Well, I am sure that your records out there will indicate and perhaps speak for themselves at that point.

[The information follows:]

IBR
INSTITUTE FOR BEHAVIORAL RESEARCH, INC.

23 July 1977

Dr. James W. Prescott
HLB Branch, CRMS, NICHD
Landow Building
7910 Woodmont Avenue
Bethesda, Maryland 20014

Dear Dr. Prescott:

I am enclosing a copy of the minutes of our Animal Care Committee meeting along with a report on the facilities from Dr. Paul K. Hildebrandt who is a D.V.M. (Diplomate) and a member of the committee. I am also enclosing copies of the reports from the last three consecutive inspections we have had from the USDA indicating that no deficiencies were noted.

Sincerely,

Edward Taub

Edward Taub, Ph.D.
Chief, Behavioral Biology Center

cc. Dr. Donald L. Eiler

ET:js

A NON-PROFIT INDEPENDENT RESEARCH AND EDUCATIONAL ORGANIZATION WITH MAIN OFFICES AT:
2429 LINDEN LANE, SILVER SPRING, MARYLAND ZIP NO. 20910; PHONE 301-585-3515

IBR
INSTITUTE FOR BEHAVIORAL RESEARCH, INC.

Minutes of the Meeting of the Animal Care Committee of I. B. R.

Held in the laboratories of the Behavioral Biology Center of the I.B.R., 9162 rear Brookville Road, on 16 June 1977.

Present: David McK. Rioch, M.D., Chairperson
Paul K. Hildebrandt, Lt. Col., VC, D.V.M., Diplomate American College Veterinary Pathologists
Edward Taub, Ph.D.

1. The Animal Care Committee of I. B. R. met this date in compliance with the requirements of the U. S. Department of Health, Education, and Welfare.

2. The committee investigated the operating room, the preparation and utility rooms, the experimental laboratory, the rooms for the monkey colony and the rat colony, the nursery for the infant monkeys and other areas involved in the use, care, and handling of the animals. The committee found all of the essential requirements to be adequately met. The care, handling, and use of the animals were regarded as fully acceptable, humane, and met all the requirements of the regulations as stated in the "Guide for the Care and Use of Laboratory Animals. D. H. E. W. Publication No. (N.I.H.) 74-23, 1974."

Copies to: Lt. Col. Paul K. Hildebrandt
Dr. Edward Taub
Mrs. Leslie Brown
Dr. H. McIlvaine Parsons
Dr. David McK. Rioch

David McK. Rioch.

7 July 1977

Dr. Edward Taub
Institute For Behavioral
Research, Inc.
2429 Linden Lane
Silver Spring, MD 20910

Dear Doctor Taub:

The following are the results of June 1977 inspection concerning Laboratory Animal Care at the IBR, Inc. Two inspections were conducted during the Month of June 1977. It is true that the animal facilities at IBR are not the most modern, however, the following was noted:

1. Caging facilities were adequate as far as space requirements are concerned.

2. Temperature requirements were adequate.

3. Cleanliness was exceptionally good. The lack of a floor drain in the monkey room poses on inconvenience, however, the floor is cleaned daily by scrubbing and mopping. This means of cleaning the floor causes an increased workload on the cleaning staff, however, the floor is cleaned in a satisfactory manner.

4. Air circulation appeared adequate, as only minimum orders were noted.

5. Surgical wounds were dressed daily, and monkeys with surgical wounds seemed comfortable. Because of the small number of monkeys in the facility, the individual attention given to animals was impressive.

6. Food and water was available to animals at all times. Animals that had undergone surgical procedures were individually cared for by increased padding and being hand fed, watered, and given extra fruit. Dipers were applied and utilized as required.

7. The Surgery Room is small, however, it was clean and anesthesia machines, and surgical packs were in adequate supply.

Recommendations:

1. Loose equipment in hallways should be placed in storage rooms or arranged in a more neat and orderly manner.

2. Several rooms and hallways would appear more pleasing if repainted.

3. Assurance that alternate cleaning, and lab animal care personnel are available. The facility appeared to be running smoothly with the staff which was present on the days of inspection. However, when permanent staff personnel are on sick leave or annual leave, alternate staff members must be fully capable of caring for all animals. Because this facility is not as modern as many laboratory animal facilities, it is imperative that greater attention continually be given to animal care and cleaning than is usually required by laboratory animal care personnel.

Sincerely yours,

Paul K. Hildebrandt
PAUL K. HILDEBRANDT, D.V.M.

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

INSPECTION OF ANIMAL FACILITIES, SITES OR PREMISES

FORM APPROVED: [illegible]

1. LICENSE NO. OR REGISTRATION NO.
2. PAGE
4. DATE OF THIS INSPECTION 5-10-77
5. TIME
6. DATE OF LAST INSPECTION
7. TIME

3. TYPE (Check one or specify)
EXHIBITOR ☐ LICENSED DEALER ☐ HOLDING FACILITY ☐
REGISTERED RESEARCH FACILITY ☐ REGISTERED RESEARCH SITE ☐
OTHER (Specify)

8. NAME & MAILING ADDRESS OF RESEARCH FACILITY, SITE, ZOO, CIRCUS, DEALER OR OTHER
BEHAVIORAL Biological
Center 6192 [illegible]ville
Road Silver Spring MD 20910

9. LOCATION OR ADDRESS OF PREMISES AT TIME OF THIS INSPECTION (If different from item 8)
Institute of BEHAVIORAL
RESEARCH 2429 Linden Lane
Silver Spring MD 20910

10. NAME & ADDRESS OF VETERINARIAN FOR FACILITY, SITE OR PREMISE
Dr. [illegible] Fichera
Hazleton Laboratories
Vienna VA

11. HAS A PROGRAM OF VETERINARY MEDICAL CARE AND EUTHANASIA BEEN PLANNED WITH REGISTRANT'S OR LICENSEE'S CONSULTING VETERINARIAN AND WRITTEN PLAN SUBMITTED TO THE USDA VETERINARIAN IN CHARGE?
YES ☒ NO ☐
IF "NO", GIVE REASON

		DOGS A	CATS B	PRIMATES C	GUINEA PIGS D	HAMSTERS E	RABBITS F	G	H	I	J	K	L	M	N	O	P
	12. No. dogs and cats listed on VS Form 18-5 this date																
	13. No. animals inspected this date			26													
STANDARDS – ✓ = adequate; CIRCLE if deficient (explain in item 49); NA if not applicable																	
FACILITIES – GENERAL	14. Structural strength	3.1	3.1	3.75	3.25	3.25	3.50	3.100						3.100			
	15. Water and electric power	3.1	3.1	3.75	3.25	3.25	3.50	3.100						3.100			
	16. Storage of food & bedding	3.1	3.1	3.75	3.25	3.25	3.50	3.100						3.100			
	17. Waste disposal	3.1	3.1	3.75	3.25	3.25	3.50	3.100						3.100			
	18. Washrooms and sinks	3.1	3.1	3.75	3.25	3.25	3.50	3.100						3.100			
FACILITIES – INDOOR	19. Heating and temperature	3.2	3.2	3.76	3.26	3.26	3.51	3.101						3.101			
	20. Ventilation	3.2	3.2	3.76	3.26	3.26	3.51	3.101						3.101			
	21. Lighting	3.2	3.2	3.76	3.26	3.26	3.51	3.101						3.101			
	22. Interior surfaces	3.2	3.2	3.76	3.26	3.26	3.51										
	23. Drainage	3.2	3.2	3.76				3.101						3.101			
FACILITIES – OUTDOOR	24. Shelter from sunlight	3.3	3.3	3.77	3.27		3.52	3.102						3.102			
	25. Shelter from rain or snow	3.3	3.3	3.77	3.27		3.52	3.102						3.102			
	26. Shelter from cold weather	3.3	3.3	3.77	3.27		3.52	3.102						3.102			
	27. Drainage	3.3	3.3	3.77	3.27		3.52	3.102						3.102			
PRIMARY ENCLOSURES	28. General requirements	3.4	3.4	3.78	3.28	3.28	3.53										
	29. Protection from predators	3.4	3.4	3.78			3.53										
	30. Additional requirements		3.4				3.53										
	31. Space requirements	[illegible]	[illegible]	[illegible]	3.28	3.28	3.53	3.103						3.103			
ANIMAL HEALTH AND HUSBANDRY	32. Feeding	3.5	3.5	3.79	3.29	3.29	3.54	3.104						3.104			
	33. Watering	3.6	3.6	3.80	3.30	3.30	3.55	3.105						3.105			
	34. Sanitation	3.7	3.7	3.81	3.31	3.31	3.56	3.106						3.106			
	35. Cleaning	3.7	3.7	3.81	3.31	3.31	3.56	3.106						3.106			
	36. Housekeeping	3.7	3.7	3.81	3.31	3.31	3.56	3.106						3.106			
	37. Pest Control	3.7	3.7	3.81	3.31	3.31	3.56	3.106						3.106			
	38. Employees	3.8	3.8	3.82	3.32	3.32	3.57	3.107						3.107			
	39. Classification & Separation	3.9	3.9	3.83	3.33	3.33	3.58	3.108						3.108			
	40. Veterinary Care	3.10	3.10	3.84	3.34	3.34	3.59	3.109						3.109			
	41. Handling							3.110						3.110			
TRANSPORTATION	42. Vehicles	3.11	3.11	3.85	3.35	3.35	3.60	3.111						3.111			
	43. Transport Enclosures	3.12	3.12	3.86	3.36	3.36	3.61	3.112						3.112			
	44. Food and Water	3.13	3.13	3.87	3.37	3.37	3.62	3.113						3.113			
	45. Care in transit	3.14	3.14	3.88	3.38	3.38	3.63	3.114						3.114			

CAPTIVE WILD ANIMALS (Specify)

[illegible]

COMPLIANCE WITH REGULATIONS	YES	NO	EXPLAIN IF "NO"
46. Is identification of animals being conducted in compliance with Section 2.50 of the regulations?			
47. Are records being kept in the manner prescribed in Sections 2.75 and 2.76 of the regulations?			
48. Are dogs and cats being held the number of days required by Section 2.101 of the regulations?			

VS FORM 18-8
SEPT 1974
REPLACES EDITION OF 18-8 (6/72) WHICH MAY BE USED.

49. RECORD: [illegible] (Refer to applicable item by number and give action [illegible] that is not in compliance; specify each corrective measure that must be taken for compliance - if more space is needed attach additional sheets)

NO DEFICIENCIE NOTED

50. PREPARED & APPROVED BY (Signature of Veterinarian or Inspector) DVM

51. DATE 5-10-77

52. OFFICIAL STATION College Park MD

53. COPY OF INSPECTION REPORT RECEIVED (Signature) E. Taub

54. TITLE Chief, Behavioral Biology Cntr

55. DATE 5/10/77

56. COMMENTS OR INSTRUCTIONS BY REVIEWER (Include corrective action taken on deficiencies at last inspection)

57. REVIEWED BY (Signature)

58. TITLE

59. DATE

May 12, 1977

Mr. Terry Lierman
Senate Appropriations Committee, DHEW
Dirksen Building - Room 1103
Washington, D.C. 20510

Dear Mr. Lierman:

Two letters from Ms. Fay Brisk, one to you dated April 27 and one to Donald Clark, National Institutes of Health, of March 22, have been sent to me for comment. I answered the March 22 letter and a copy of that reply is attached. Some portions which will be useful to you now are marked.

Most of the April 27 letter is critical of the U.S. Department of Agriculture. I assume they will be given an opportunity to comment, so I will skip down to the last paragraph where she accuses NIH of indifference. I checked with USDA as soon as I learned of this complaint and made sure that they would look into it. Both USDA and NIH inspectors have visited the Institute for Behavioral Research laboratories and have found that the problem has been cleared up. The NIH inspectors did offer a few suggestions for improvement, but did not find "filthy conditions."

We are constantly reviewing the use of animals by our grantees and looking for practical ways to perform our mission without unnecessary discomfort to animals. Just about a month before Ms. Brisk's first letter I had revised our animal policy to make it clearer to grantees that the USDA regulations must be followed.

And we assume that the appropriate committees in Congress do annually ". . .have another look at how the taxpayers' money is spent. . ." by NIH.

Call me on 496-7005 if I can help you further.

Sincerely yours,

Roy Kinard, D.V.M.
Animal Welfare Officer
Office for Protection
from Research Risks
Office of the Director

✓ cc:
Mr. Donald E. Clark, NICHD

April 27,

Mr. Terry Lierman
Senate Appropriations Committee, HEW
Rm 1108 Dirksen Bldg.
Washington,D.C., 20510

Dear Terry,

The attached letter to Donald Clark of NIH is self-explanatory.

Under the 1966 Laboratory Animal Welfare Act and amendments, USDA is required to register and inspect NIH-funded research laboratories. These laboratories are required to file an annual report with USDA. Obviously, this was not done in the Silver Spring case.

Based on my almost daily experience with USDA, I can assure you that the Silver Spring case is not unique. The neglect is nation-wide.

In D.C., for example, USDA's Area 3 did not even bother to list the research laboratories it inspected during 1975. (See USDA's Report to Congress for that year.) This "oversight" was called to USDA's attention, and was probably corrected this year. However, USDA officials admit they can spend only 5 percent of their time on animal welfare inspections, so it can be assumed that NIH-funded laboratories are rarely inspected.

USDA's neglect, however, does not excuse NIH's apparent indifference to this neglect. I believe the Senate Appropriations Committee ought to have another look at how the taxpayers' money is spent on NIH-approved experiments.

Thank you for your interest and cooperation.

Sincerely,

Fay B.

Fay Brisk

2500 Que St.,NW
Washington,D.C., 20007

My credentials: Former Penna. newspaperwoman
White House writer on consumer affairs-- 1962-1970
Recipient, Albert Schweitzer Medal, 1976
Currently free-lancing.

MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH

TO : Animal Welfare Officer, OPRR

DATE: April 18, 1977

FROM : Chief, Office of Grants and Contracts, NICHD

SUBJECT: Institute for Behavioral Research Inc., Silver Spring, Md.

As a result of a letter from a Ms Fay Brisk alleging unclean and inhumane conditions for monkeys used as research animals at the above facility, a site visit was conducted on April 5, 1977. Those participating were Dr. J. Phillips, Chief, Unit on Laboratory Animal Medicine and Core, NIMH, Mr. Donald Kiler, Office of Grants and Contracts, NICHD, and Dr. James Prescott, Health Scientist Administrator, Human Learning and Behavior Branch, NICHD. We met with Dr. Edward Taub, Principal Investigator of grant HD-08579, entitled "Fetal Origins of Primate Sensory - Motor Integration" and Dr. H. McIlvaine Parsons, President of the Institute for Behaviorial Research.

In general, laboratory conditions were found to be clean and adequate. The animals appeared to be healthy and well cared for. Recent inspection reports by the Department of Agriculture were presented which noted no violations. It was determined that IBR at present had no standing Animal Welfare Review Committee to evaluate on a continuing bases animal care practices. Dr. Phillip's made various recommendations which are detailed in his attached report.

In summary the allegations of Ms. Fay Brisk could not be substantiated at the time of the site visit.

Donald E. Clark

MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH

TO : For the Record

DATE: April 14, 1977

FROM : Health Scientist Administrator, HLB Branch, CRMC, NICHD

SUBJECT: Laboratory Visit, Institute for Behavioral Research, Dr. Edward Taub, Principal Investigator, "Fetal Origins of Primate Sensory-Motor Integration" (HD/NS 08579)

In response to a letter from a Fay Brisk which charged filthy and inhumane laboratory conditions for the housing of monkeys in the above, NICHD grant research supported program, a laboratory visit was made to discuss these issues with Dr. Taub and Dr. H. McIlvaine Parsons, President, I.B.R.

The site visit group consisted of a consultant Jere M. Phillips, D.V.M., Chief, Unit on Laboratory Animal Medicine and Care, IRP, NIMH, Don Eiler, Office of Grants and Contracts, NICHD and myself. Dr. Phillips' report and a letter of 8 April 1977 from Dr. Taub is attached to this memo.

Our laboratory visit did not support any of the charges contained in the letter from Fay Brisk. Additionally, Dr. Taub provided us with copies of two inspections from the USDA which found no violation of animal care regulations. Verbal instructions to clean the floor was given since the inspection was made on Monday morning before cleaning from the weekend could be accomplished. Food throwing by monkeys is commonplace and can give the appearance of a dirty floor, particularly, when cleaning is not done over the weekend.

Dr. Phillips' recommended that improved caging could be obtained with stainless steel or oxidized aluminum cages which would permit easy steam cleaning of cages which is not currently being practiced. Despite this factor, Dr. Taub reported only one death of a monkey due to illness in the past seven years, thus attesting to the healthy environment of the animal laboratory.

It would appear that Fay Brisk's letter of charges has maligned the I.B.R. laboratory and it is of some significance that neither she or Mrs. Goldenburgh, who visited the I.B.R. laboratory, made any report to the Montgomery County Humane Society which Mrs. Goldenburgh represented.

Dr. Taub was informed that an annual review of his laboratory by a standing committee competent to evaluate animal laboratories was required by regulations and that he should comply with this regulation.

James W. Prescott

James W. Prescott, Ph.D.

MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTE OF MENTAL HEALTH

TO : Dr. James W. Prescott
Health Scientist Administrator
NICHHD

DATE: April 12, 1977

FROM : Dr. Jere M. Phillips, Chief
Unit on Laboratory Animal
Medicine & Care, IRP, NIMH

SUBJECT: Consultant Visit to Institute for Behavioral Research

On the request of Dr. James Prescott, a consultant visit was made on April 5, 1977 to the Institute for Behavioral Research, 9162 Brookvale Road, Silver Spring, Maryland. The purpose of the visit was to investigate the charges made by Fay Brisk in a letter dated March 22, 1977 to Mr. Donald Clark.

The facility is located in an industrial park in the Forest Glenn section of Silver Spring. It consists of one large animal room with approximately 20 primate cages, a surgical suite, small quarantine room, food preparation area, testing rooms and offices. The surgical suite was exceptionally clean and well organized. The animal room could not be considered filthy. The type of caging and the animals housed within the room have to be considered. Due to the nature of primates, it is impossible to keep the cages spotless 100% of the time.

The facility was registered with the USDA on February 23, 1977, registration number 51-30. Two inspections by USDA inspectors during the month of March listed no discrepencies.

Dr. Edward Taub, who is neuropsychologist, and Mr. Gilbert Barro, who is a technician with considerable experience in the field, do all of the neurosurgery. All prenatal surgery is accomplished at Litton Bionetics Laboratories under the supervision of a veterinarian. Post-operative animals appeared to be well cared for. No evidence of gross neglect was evident.

An animal care committee should be established as soon as possible. This committee should have as a member a diplomate of the American College of Laboratory Animal Medicine. The committee should meet at least once a year to evaluate animal care practices. A veterinary consultant should be retained to provide as needed veterinary services. This should include periodic visits to assist in maintaining a high level of animal care.

continued

The animal caging should be upgraded in the near future. The present type of caging is very difficult to clean and maintain. I would recommend the purchase of caging that can be removed from the room and steam sterilized or washed and chemically sterilized on a weekly basis. The pans beneath each cage should be cleaned daily.

A disease surveillance program should include daily health checks on each animal and tuberculin testing each 90 days. If a positive reaction to tuberculosis is encountered, the animals should be tested every two weeks until they have five negative tests. An employee health program should be established in order to protect the personnel working with the animals. This should include yearly tuberculin testing and updating of immunizations.

Jere M Phillips

Jere M. Phillips, D.V.M.

JMP:jb

Mr. Walgren. What you are saying is that you feel that from an objective standpoint, until this was brought to the public's attention in recent weeks, you had no ongoing reason to be terribly concerned with that laboratory?

Dr. Raub. That is correct, sir. Absent a finding by the Department of Agriculture of noncompliance with the Animal Welfare Act and in the face of some reports from site-visit teams of 2 and 3 years ago—not site visits for the facility per se but site visits associated with reviewing research applications—that indicated that the overall facilities were generally satisfactory, we had no basis to intervene before the most recent reports.

Mr. Walgren. So site visits did indicate that the overall conditions were generally satisfactory?

Dr. Raub. Associated with the review of the research grant application were general statements to the effect that the facilities were satisfactory.

Mr. Walgren. I see.

Dr. Raub. It is not clear as to the extent to which those comments were addressed, in particular, to the quality of caging or the sanitation of the animal rooms and so on.

Mr. Walgren. I guess what I am trying to get at is that apparently this initial warning in 1977 was resolved in some way so that this laboratory was not subject to the frequent site visits that you indicated; a laboratory where there were problems would be visited by NIH under present practice?

Dr. Raub. That is correct.

Mr. Walgren. In how many laboratories is NIH generally aware of having problems to the degree that they are under your closer surveillance nationwide?

Dr. Raub. Overall we have written assurances on file from about 650 institutions. Only a relative handful of those at any time are the subject of particular interactions between our NIH offices and the institutional officials. And in most of the cases it has been a nonadversarial one. Rather there has been a recognition on the part of the institution that it has a responsibility to remedy certain deficiencies.

Mr. Walgren. But your point is that at any point in time there are a number of laboratories that NIH is leaning on or interacting with in a specific way to try to improve certain conditions that might have given rise to criticism?

Dr. Raub. As I indicated in my testimony, Mr. Chairman, there are many ways that real or apparent problems come to our attention. For the vast majority of those cases we have been able to effect a resolution of them by a cooperative effort with the institutions.

Mr. Walgren. It would be, I think, helpful to me anyway, if you could specify how many such institutions existed at any one period of time.

Dr. Raub. I do not know a specific number offhand, Mr. Chairman. It is something we could provide to you.

Mr. Walgren. I would like, if you would, to try to take a snapshot of your effort in this area so that we can make some assessment of how extensive NIH's effort is in this area, and also know from that the numbers that are involved so we can make an assessment of the degree of this problem. And if I could ask you to perhaps go back to the first of the year, of the preceding 2 years and look in your records and see how many laboratories were under specific surveillance by NIH with respect to actual criticisms that were brought to their attention, other than written assurances.

Dr. **Raub**. Yes, sir.

Mr. **Walgren**. If you would try to do that for me I would appreciate it.

[The information follows:]

DEPARTMENT OF HEALTH & HUMAN SERVICES

Memorandum

Date November 6, 1981

From Office for Protection from Research Risks, OD

Subject Institutions Possibly Non-Compliant with PHS Animal Welfare Policy (1980, 1981)

To Division of Legislative Analysis, OPPE, OD
Attention of Ms. Janet Sobell

Institution: Roswell Park Institute (RPMI), Buffalo, New York

Source of initial information: Memo from the National Cancer Institute Program Director (Dr. Mary Marcoux) to Dr. Roy Kinard, OPRR, with the Summary Statement of a Center Core grant for which a site visit had been made (5-6/80 Council).

Criticism: Excerpts, not necessarily sequential, from site visit team's Critique in Summary Statement:

> "There is reason to believe that RPMI does not now comply with the intent of the NIH policy on animal care. Specific deficiencies suggesting non-compliance include:
>
> 1. Cages and racks that are rusty and/or have other defects.
> 2. Cage washers are inadequate.
> 3. Outdated feed.
> 4. Lack of emergency, weekend, and holiday care.
> 5. Lack of adequate veterinary care.
> 6. Lack of quarantine of newly-arrived animals.
> 7. Lack of diagnostic laboratory service.
>
> "An administrative structure must be developed for line responsibility and accountability. Space does not meet acceptable standards, nor is it efficiently utilized. A master plan should be developed. A standardized cage plan should be developed. Animal caretakers have not been given adequate on-the-job training.
>
> "Executive Secretary's Note: The Committee recommends that the concern about possible noncompliance with the NIH Policy on Animal Care be referred to the NIH Office for Protection from Research Risks for further evaluation and resolution. It should be emphasized that (1) the deficiencies appear to be due to a lack of knowledge rather than purposeful neglect; (2) although the culmination of deficiencies is serious, they are--for the most part--borderline when assessed individually."

Action: Dr. Kinard wrote (6/17/80) to Dr. Gerald Murphy, Director of RPMI. Reply (9/24/80) received from Dr. Edwin Mirand, Associate Institute Director and Chairman, Institute Animal Care Committee,with a detailed report of inspection, multiple improvements made during the previous year, membership changes in the Animal Care Committee, and additional improvements to be made. (Refutation of most of the issues raised in the NCI Summary Statement had been made earlier.)

Resolution: Letter of 9/24/80 from RPMI accepted as an amendment of the RPMI assurance on file, under Option 3 of the PHS Animal Welfare Policy (deficiencies listed, improvements made or in progress, and plans for future improvements; detailed annual report of progress required).

Institution: University of South Alabama College of Medicine, Mobile

Source of initial information: Phone call from Dr. Garrett Keefer, National Cancer Institute, to Dr. Roy Kinard: reported possible violation of the animal welfare policy, after a site visit re a grant under review (5-6/81 Council).

Criticism: Substandard facilities and need for stronger management of animal use and facilities.

Action: Since the University had not responded to the original notification of the new PHS animal welfare policy (which had superseded the one under DHEW for which the University still had an assurance in effect), compliance with the new policy was again requested in January 1981. The assurance, dated March 19, 1981, was filed under Option 3 (deficiencies listed, improvements made or in progress, and plans for future improvements; detailed annual report of progress required).

Resolution: Routine acknowledgment-acceptance by OPRR of the assurance after missing information was requested and supplied.

Institution: Vanderbilt University, Nashville, Tennessee

Source of initial information: A letter (8/28/81) from Dr. Shirley McGreal, Co-Chairwoman of the International Primate Protection League, was sent to the Director of the National Eye Institute ascribing unsanitary conditions, as reported by USDA inspections in 1978 and 1979, at a laboratory being used by one investigator for three NEI grants.

Action: The letter was sent by Dr. Ronald Geller, Associate Director of Extramural and Collaborative Programs, NEI, to OPRR for further action. Dr. Roy Kinard then wrote to Dr. Vernon Wilson, Vice President for Medical Affairs at Vanderbilt University. Dr. Kinard's letter requested that the University's Animal Care Committee inspect the facilities, send a report on sanitary conditions and procedures, and, if necessary, a plan to correct any deficiencies. Dr. Roscoe Robinson, who had replaced Dr. Wilson in that position, replied under date of 9/24/81 with the information that each deficiency reported by the USDA in 1978 and 1979 had been corrected and re-inspected by the USDA within a few weeks of the initial report of the problem. Also, the University is fully accredited by the American Association for Accreditation of Laboratory Animal Care and passed a recent inspection by AAALAC, as well as periodic inspections by the University's Animal Care Committee.

Resolution: Dr. McGreal was sent a copy of Dr. Robinson's letter. Vanderbilt University is considered to be in full compliance with the PHS Animal Welfare Policy.

Possible Non-Compliance with Public Health Service Animal Welfare Policy

(Prepared by Office for Protection from Research Risks, Office of the Director, NIH) OPRR, OD

Arranged by Council Rounds, January 1980 through June 1981

Advisory Council	Institution	Principle Investigator (P.I.)	Grant ID	Criticism	How Noticed	Action **	Resolution
5-6/81 continued							
	Aggregation of categorized criticisms		4 applications	Principle 1 (expertise questioned	In Critique text of Summary	None awarded	
	" " "	"	3 applications	Principle 4 (justified f/anticipated results)	"	All disapproved	
	" " "	"	1 application (see previous page)	Principle 7 (unnecessary suffering)	"	Disapproved	
	" " "	"	2 applications	1 needed special facilities, 1 needed improved facilities (minority grant)	In Resource and Environment text of Summary	1 disapproved, 1 award uncertain	
	" " "	"	1 application	Criticized inappropriate procedure	In Critique text of Summary	Not awarded	
	" " "	"	1 application	Excessive number of animals to be used	"	Not awarded	
	U. of South Alabama			Substandard facilities	NCI site visit	NCI communicated with OPRR;OPRR letter to University 1/81; reply rec'd 3/81 listing multiple improvements made and plans for future improvements. Acceptable response.	
	- - -(identifiers deleted)- - -		1 application	Substandard facilities	NCI reported to OPRR	Not awarded	OPRR wrote to University. No reply. New assurance now needed.

** Principal Investigators are routinely sent copies of Summary Statements after Council meeting.

Possible Non-Compliance with Public Health Service Animal Welfare Policy

(Prepared by Office for Protection from Research Risks, Office of the Director, NIH) OPRR, OD
Arranged by Council Rounds, January 1980 through June 1981

Advisory Council	Institution	Principal Investigator (P.I.)	Grant ID	Criticism	How Noticed	Action **	Resolution
5-6/81	- - - -(identifiers deleted)- - - -			Dogs:transverse osteotomy to both tibias	Summary Statement Spec.Note and/or spec. paragraph	Not awarded	AM institute wrote to P.I. Resubmitted application acceptable.
"	"	"		Dogs:reopening wounds	"	Disapproved	
"	"	"		Monkeys:high distension pressure	"	Disapproved	
"	"	"		Principle 7 (unnecessary suffering)	"	Disapproved	
"	"	"		Mice, unanesthetized: painful injections	"	Disapproved	
"	"	"		Guinea pigs:sustained skin irritation	In Critique text of Summary	Disapproved	
"	"	"		Rats:need to maintain anesthetization	"	Disapproved	
"	"	"		Cats, paralyzed:degree of anesthetization	"	Not awarded	
"	"	"		Dogs:monitoring of spine postsurgery pain	Summary Statement Spec.Note and paragraph	Not awarded	HL institute wrote to P.I.
"	"	"		Dogs:exercise after surgery	"	Not awarded	
"	Mt. Sinai Med.Ctr	Ahmed, T.	1 R23 HL/AI 27798-01	Sheep:explicit surgical details needed	"	Awarded	HL institute resolved satisfactorily.
"	U. of Michigan	Lucchesi, B.R.	1 R01 HL 27817-01	Dogs,conscious:need for analgesia post surgery	"	Awarded	Initial Review Group wrote to PI P.I.reply acceptable.
"	- - - -(identifiers deleted)- - - -			Rats;paralyzed,stressed: anesthesia needed	"	Not awarded	
"	"	"		Rats:need for local anesthesia postsurgery	"	Disapproved	
"	"	"		Rats,cats:pain control details needed	"	Not awarded	
	"	"		Baboons: Principle 4 (justified by anticipated results)	DRR reported to OPRR	Not awarded	Scientific determination involved

Possible Non-Compliance with Public Health Service Animal Welfare Policy
(Prepared by Office for Protection from Research Risks, Office of the Director, NIH)
Arranged by Council Rounds, January 1980 through June 1981

Advisory Council	Institution	Principal Investigator	Grant ID	Criticism	How Noticed	Action **	Resolution
1-2/81	Johns Hopkins U.	McHugh, P.R.	2 R01 AM 19302-06	Monkeys, chaired	Summary Statement Spec.Note and/or spec. paragraph	Award if ACC committee OKs.	Letter from official: humane substitution to be used
"	- - - -(identifiers deleted)- - - - - - -			Monkeys:blinding both eyes not justified	"	Not awarded	
"	"	"		Cats:hepatic lesions, toxic chemicals	"	Disapproved	
"	"	"		Rodents:tooth fracture procedure needs clarification	"	Not awarded	
"	"	"		Dogs:chronic hypothalamic lesions not justified	"	Disapproved	
"	"	"		Ewes: sustained hyperthermia	"	Not awarded	
"	"	"		Rats:sleep deprivation procedures	"	Award pending consideration of concern	
"	"	"		Rats:multiple blood samples	In Critique text of Summary	Disapproved	
"	"	"		Rats:severely traumatized	"	Disapproved	
"	"	"		Rabbits:excessive blood sampling	"	Not awarded	
	Aggregation of categorized criticisms		11 applications	Excessive no. to be used	"	7 had reduced budgets for animals	
	" "	" "	25 "	Unnecessary use of animals	"	4 disapproved,17 not awarded	
	" "	" "	54 "	Criticism of animal model	"	19 disapproved, 28 not awarded	

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Possible Non-Compliance with Public Health Service Animal Welfare Policy
(Prepared by Office for Protection from Research Risks, Office of the Director, NIH) OPRR, OD
Arranged by Council Rounds January 1981 through June 1981

Advisory Council	Institution	(P.I.) Principal Investigator	Grant ID	Criticism	How Noticed	Action**	Resolution
10-11/80	- - - -(identifiers deleted)- - - - - - -			Monkeys,anesthetized: painful antigen injection	Summary Statement Spec.Note and/or spec. paragraph	Disapproved	(Other method recommended)
"	Vanderbilt U.	McKanna, J.A.	2 RO1 EY 02221-04	Monkeys,operated on: cages too small	"	Awarded	Plans to minimize stress supplied on request by EY institu
"	- - - -(identifiers deleted)- - - - - - -			Cats:assurance of vet. supervision needed	"	Not awarded	EY inst.communicated with p.i.and institution
"	"	"		Mice:disapproval of bilateral enucleation	"	Not awarded	EY inst.communicated with pi.
"	"	"		Mice,burn procedures: unjustified	"	Disapproved	GM inst.wrote to p.i.
"	"	"		Cats:paralyzed but not anesthetized	"	Not awarded	HL inst.wrote to p.i.
"	"	"		Rabbits, rats: no details re burn procedures	"	Disapproved	
"	"	"		Monkeys: prolonged anesthetization	"	Disapproved	
"	"	"		Guinea pigs: multiple painful procedures	"	Disapproved	NS institute wrote to p.i.
"	"	"		Monkeys: chronic pain provisions f/adequ. treatment needed	"	Not awarded	
"	"	"		Mice:excessive blood sampling	In Critique text of Summary	Not awarded	
"	"	"		Pigs:excessive surgical procedures,anesth.?	"	Not awarded	
"	"	"		Dogs, rodents:dosage of drugs	"	Disapproved	GM institute wrote to p.i.
	Aggregation of categorized criticisms		2 applications	Principle 1 (expertise) questioned	"	1 disapproved, 1 awarded based on expertise of co-investigator	
"	Roswell Park Mem. Inst.	Murphy, G.P.	Core grant - NCI	Deficiencies in animal care and facilities	Cancer Inst. site visit	Reported to OPRR which wrote to p.i.6/17/80 Reply from p.i. 9/20/80 listing major steps taken to correct deficiencies	

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Possible Non-Compliance with Public Health Service Animal Welfare Policy

(Prepared by Office for Protection from Research Risks, Office of the Director, NIH) OPRR,OD
Arranged by Council Rounds, January 1980 through June 1981

Advisory Council	Institution	Principal Investigator	Grant ID	Criticism	How Noticed	Action**	Resolution
5-6/80	- - -(identifiers deleted)- - - - - - - -			Dogs:method of euthanizing	Summary Statement Spec.Note and/or spec. paragraph	Not awarded	
"	"	"		Dogs: blinding	"	Not awarded	
"	U. of Nebraska	Gilmore, J.P.	2 R01 HL 13427-11	Monkeys:unanesthetized during procedures	"	Awarded	Letter to HL institute from P.I. fully explanatory;letter from director of U.Neb.animal resource facility corroborates.
"	- - - (identifiers deleted)- - - - - - - -			Rats: excessive exercising	"	Not awarded	
"	"	"		Dogs, conscious: cigarette smoke via tracheostomy	"	Disapproved	
"							
"	"	"		Cats:unnecessary paralysis	"	Disapproved	
"	"	"		Rats:unnecessarily harsh survival tests	In Critique text of Summary	Not awarded	
"	"	"		Rats:water bath vs. lt.anesthesia	"	Not awarded	
"	"	"		Goats:tranquilized, not anesthetized	"	Disapproved	
"	U. of New Mexico	Atencio, A.C.	2 S06 RR 08139-07	Cats:trauma of cerebellar removal	"	(P.I. rec'd Summary.)	Multiple project grant - awarded
"	Aggregation of categorized criticisms		28 applications	Criticism of animal model	"	8 disapproved;	18 not awarded;2 awarded concerns outweighed.
"	" "	" "	2 applications	Principles 1 and 4 questioned (expertise and justification)	"	1 disapproved;1 not awarded	
"	" "	" "	9 applications	Criticism:unnec.use of animals	"	3 disapproved;5 not awarded;1 awarded	
"	" "	" "	9 applications	Criticism: excessive no. of animals used	"	3 disapproved;4 not awarded;2 awarded with reduction of budget re animals	
"	" "	" "	2 applications	Criticism of facilities	"	Both awarded, funds allocated for improvements (DRR minority grants)	
"	" "	" "	1 application	Recommended stronger monitoring by animal committtee	"	Awarded(DRR minority grant)	

Possible Non-Compliance with Public Health Service Animal Welfare Policy

(Prepared by Office for Protection from Research Risks, Office of the Director, NIH)
Arranged by Council Rounds, January 1980 through June 1981

Advisory Council	Institution	(P.I.) Principal Investigator	Grant ID	Criticism	How Noticed	Action **	OPRR,OD Resolution
1-2/80	- - -(identifiers deleted)- - - - - - -			Dogs: operative procedures	Summary Statement Spec.Note and/or spec. paragraph	Disapproved	AM institute wrote to P.I.
"	Jackson Lab.	Coleman, D.L.	2 R01 AM 14461-11	Mice:prolonged fasting	"	Awarded	AM institute wrote to P.I. P.I. reply:acceptable alternative will be used.
"	Johns Hopkins U.	McHugh, P.R.	2 R01 AM 19302-06	Monkeys, chaired: provisions f/comfort	"	Awarded	Letters to AM institute from P.I.and Director,Animal Services: no chairing:new procedure allowing in-cage mobility.
"	- - -(identifiers deleted)- - - - - -			Rats:more vet. care needed during protocol	"	Not awarded	
"	"	"		Monkeys:more anesthesia needed	"	Not awarded	
"	"	"		Dogs:noninvasive stimuli w/cold water	"	Not awarded	
"	Alton Ochsner Medical Fdn	Trippolo, N.C.	2 R01 HL 22261-03	Rats, awake:untreated surgical openings	"	Awarded	HL institute wrote.Award withheld til use of local anesthetic assured,approval by institution's animal committee.Satisfactory reply received
"	- - -(identifiers deleted)- - - - - -			Rats: prolonged deprivation of sleep	"	Not awarded	
"	"	"		Dogs in pain:cough stimulation while emerging from anesthesia	"	Disapproved	
"	Aggregation of categorized criticisms		5 applications	Principle 1 of policy (re expertise)	In Critique text of Summary	2 disapproved, 3 not awarded	
"	" " " "		6 applications	Criticism of animal model	"	3 disapproved, 3 not awarded	

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Mr. **Walgren**. Thinking of the animal care committee, under your protocols, or your method of operating, every laboratory is supposed to have some kind of onsite, ongoing animal care committee, is that correct?

Dr. **Raub**. That is correct.

Mr. **Walgren**. And did this laboratory have such?

Dr. **Raub**. Yes, it did.

Mr. **Walgren**. Did its committee meet your guidelines for committees?

Dr. **Raub**. As indicated in our report, it did not, in that its membership had altered from the pattern of the original assurance, and we judged further that it had not been as active as it might have and should have been under the circumstances.

Mr. **Walgren**. The membership had altered, someone had left the committee?

Dr. **Raub**. Yes, sir.

Mr. **Walgren**. But is it not also true that the committee, at least as detailed in your present report, would indicate that it is almost a totally in-house committee?

Dr. **Raub**. That is correct.

Mr. **Walgren**. Do the protocols accept a totally in-house committee on animal care?

Dr. **Raub**. We have generally accepted a committee made up entirely of institutional officials or other close affiliates with it, yes, sir.

Mr. **Walgren**. Is there any effort in your protocols to try to bring a noninvolved judgment to the animal care committee?

Dr. **Raub**. We have not tried to prescribe the composition of the animal care committees at the local level in that way. To date we have relied on other means available to us, particularly the actions of the members of the peer review system as applications are reviewed centrally. Of particular notice is the fact that our second level of peer review, the National Advisory Councils include public members as well as scientists.

My impression has been that the system generally has worked well. But, given our concerns about public confidence that I indicated in my prepared testimony, one of the reasons for initiating a program of visits—both for apparent cause and randomly is that, among other things, we will get some stronger indications and better data as to the nature of the function of those local committees and their interactions with the rest of the review process.

Mr. **Weber**. Would the chairman yield at that point for a moment?

Mr. **Walgren**. I will be happy to yield.

Mr. **Weber**. Dr. Raub, I am wondering, we are talking here about guidelines and protocols and levels of regulation, and obviously we are all aware of the problems that gave rise to some of those protocols. I am wondering if there is any concern on your part about the other side of the coin. Is there any concern at NIH of the effect that the additional regulation and bureaucratization of this process will have on scientific inquiry and the freedom that has to surround genuine and needed research?

Dr. **Raub**. There is considerable concern, Mr. Weber.

Our primary concern as a research agency is that we put in place no unnecessary constraints on scientific inquiry and the ability to produce the kind of research findings that will advance our mission and ultimately serve the health of the people.

Second, we are conscious of the costs associated with the administration of the research enterprise, both at our end and in the institutions, and will try very hard, as we always have tried very hard, to insure that we not cause institutions and ourselves to incur costs in administration that are not necessary.

Nevertheless, it is my perception, and that of my colleagues that the level of public concern and the potential threat to public confidence in our management of the programs is such that satisfaction on our part is sufficient. Rather, we must take a reasonable and deliberate effort to accumulate the kind of data base that our managers, this subcommittee, and others might use to determine whether additional restraints of one kind or another are needed.

Mr. WEBER. I thank the chairman for yielding.

Mr. WALGREN. Thinking again about this particular animal care committee, why didn't this one function? You indicated that certain assurances were not kept. What is your estimate of why this animal care committee did not function?

Dr. RAUB. I can offer you only my speculation and inferences on that, Mr. Chairman.

Mr. WALGREN. Would the makeup of the committee raise any eyebrows, in your view?

Dr. RAUB. On the surface of it the makeup of the committee would not have caused any particular concern, in my view. We generally expect, and in our experience almost routinely find, that the laboratory scientists are sensitive to the issues that are outlined in the NIH guide. And we regard the incident being discussed today as a distinct aberration rather than being anywhere near typical of the conduct of other laboratories or the scientific community in general.

Mr. WALGREN. Do the members of the individual committees make any representations that they will fulfill their duty as a member of the committee?

Dr. RAUB. Other than by agreeing to serve, do you mean, Mr. Chairman?

Mr. WALGREN. Yes.

Dr. RAUB. Not that I am aware. I am not aware of any formal process of their——

Mr. WALGREN. And individual members make no submission to NIH that they agree to perform this function at present under your approved system?

Dr. RAUB. No, sir. We have operated through the institutional officials, requiring that the animal care committee be advisory to the institutional officials rather than to the NIH directly.

Mr. WALGREN. I had in my mind, and I was looking for it here and cannot find it, some indication that a quorum of the animal care committee under your guidelines would have to be made up of some relatively noninvolved parties. Is that not correct?

Dr. RAUB. I do not recall that, sir.

Mr. WALGREN. We will leave the record open here, and perhaps if I can find it I can put it in.

Dr. RAUB. One of my colleagues just indicated that when there is a review of an individual project that condition obtains. But as a general rule, it does not.

Mr. WALGREN. Every time the animal care committee functions it would have to review an individual project, would it not?

Dr. RAUB. No, sir. There are times when the animal care committee is primarily concerned with the overall adequacy of the facilities, the institutional procedures, the arrangements for veterinary medical care, the quality of training of the——

Mr. WALGREN. And that was the case here——

Dr. RAUB. Of the staff.

Mr. WALGREN. Because our problem with this facility is the overall condition of the facility, and apparently this animal care committee was nonfunctional and it did not function even under the guidelines you have that a quorum has to be not involved.

I hate to belabor the point, but I do need to do it for my own understanding.

How noninvolved must the quorum be under your guidelines?

Dr. RAUB. How noninvolved must the quorum——

Mr. WALGREN. Yes, how many disinterested persons are required by your guidelines to form a quorum of the animal care committee?

Dr. RAUB. It just was pointed out to me, Mr. Chairman, that the specific language that you are referring to has to do with the disassociation from that activity of any individual directly involved with the project itself that is under review.

Mr. WALGREN. I see. So everybody could be in-house, but if they were not working on one specific scientific inquiry, they would qualify as a noninvolved party, is that correct?

Dr. RAUB. That is correct.

Mr. WALGREN. And in this instance everybody was in-house except for the veterinarian who apparently never appeared. Is that your understanding of what happened?

Dr. RAUB. My understanding is that the veterinarian who was a member of the group was not an employee of the institution, and participated annually in the review and inspection of the facilities. But to the best of my knowledge, he was otherwise not involved in the more frequent——

Mr. WALGREN. Do you know when the last time was that he was involved in participating in that annual review of the facilities?

Dr. RAUB. I do not remember the date offhand, Mr. Chairman.

Mr. WALGREN. But that would be in your record of your review, would it not?

Dr. RAUB. Yes, sir.

Mr. WALGREN. I would like to ask your view of whether or not it would be possible to get a little bit more independence in animal care committee.

Dr. RAUB. It is entirely possible to do that, Mr. Chairman. Several institutions have experimented in a variety of ways with not only a broader membership in terms of affiliation or nonaffiliation with the institution, but a broader membership in terms of the expertise and perspective that is brought to bear to the task. There are many options for exploration here.

Mr. **Walgren**. You know, this is an area that it would be difficult to legislate, but it strikes me that if you are going to start more site visits, you are going to have scientists more sensitive to the fact that they may be reviewed and they may be criticized. It would seem to me that it is an excellent opportunity, No. 1, for the NIH to put the seed in their minds that they might be subject to examination and therefore they should be very careful to be up to standard. Second, it should give you an opportunity to really make this animal care committee function.

I would appreciate if over the next several weeks or so you might give some thought to how the NIH's internal requirements for this animal care committee could properly be improved, without getting into the area that might concern other more cautious members—and it certainly is an area that I am sure it is beyond any reach of legislation—but it is one that we have to rely on you, then, to make sure is performing and functioning, and we have to rely on you to use every opportunity you have to make that happen.

Dr. **Raub**. We already had planned, Mr. Chairman, that as part of our gathering of additional data there would be a reexamination of the kinds of guidelines and any prescriptions that we wanted to make. Among other things we will look forward to seeing the experiences of a variety of institutions in the way that they configure and use these animal care committees.

Mr. **Walgren**. I appreciate that.

I have used more than my fair share of the time. The Chair would recognize Mr. Shamansky.

Mr. **Shamansky**. Thank you, Mr. Chairman.

Dr. Raub, it must have been clear from my questioning of Mr. Pacheco that I personally believe that it is necessary to have animal experimentation. Having said that, I found your testimony glib in its most pejorative sense. The use of the word "glib" is very pejoratively and very deliberately used here.

What I see here is a bureaucratic fortress of paper. As long as the paper showed up, then it is a case of mia non culpa. You guys were not responsible for anything, because the paper looked good. The promises were on paper. No followup.

You say in your statement "the NIH traditionally has not conthing came up there would be visits. We have no data on how many times you have ever felt that was necessary and what kind of followup there is.

You say in your statement the NIH traditionally has not conducted routine inspections to monitor compliance with the assurances governing the care and use of laboratory animals. We generally have relied upon principal investigators and officials of awardee institutions to identify and correct problems as they arise."

I think the chairman was trying to get to the point that all you are saying is you let those guys take care of it themselves. If no one mentions a problem, then there must be no problem. Until August there was no problem with this institution, as far as your paper was concerned.

I would like to have as objective an assessment as you are capable of. On a scale of 1 to 10, how do you assess the performance of the NIH in this situation?

Dr. **Raub**. Sir, I believe that, within the framework that we have operated, as described in my testimony, there was always the possibility that an instance of the sort we have been discussing this morning could occur. Had the earlier sets of information we had received from technical visit teams indicated anything near what the results of the police visit showed, we would have acted much sooner.

Mr. **Shamansky**. But, Dr. Raub, when you talk about the site visit, as I heard the very careful phrasing—and you are marvelously articulate—you said the visit from your people was not to look at the general facility but just that little narrow focus of your experiment. I was really straining to imagine your investigator going into this place as described by Mr. Pacheco and carefully not seeing almost anything except the most narrow focus.

What is the quality of your inspectors?

Dr. **Raub**. Sir, these are not inspectors in the sense that I——

Mr. **Shamansky**. Well, what are they then?

Dr. **Raub**. The visits to which I was referring are visits of NIH staff members and NIH consultants, peer review scientists, for the primary purpose of assessing a piece of research that is proposed for funding.

It is true that the primary thrust of that visit is to understand the nature of the research that is proposed, and the details of the procedures and to make a judgment about the scientific merit of what is before them.

It is, in my experience, sir, almost never the case that those visitors are blind to or otherwise ignore inadequacies in the general facilities around them. And it is regularly the case that, as part of the peer review of applications, real or potential problems are identified for followup by us and by the institutions.

Mr. **Shamansky**. Doctor, I am going to get back to—let's try 1 to 10 again. What do you think about your performance in this case, on a scale of 1 to 10, because to be frank with you, I feel an obligation to be candid. The excessive words here I find obfuscating.

Just on a 1 to 10 how did you do in this one?

Dr. **Raub**. The system failed in this case.

Mr. **Shamansky**. Fine. The system failed.

Now, after all this time we have established the system failed. And frankly, with what you have said in your testimony that you are going to do in the future, it strikes this representative at least, that you should have been doing already.

Mr. **Weber**. Will the gentleman yield on that point?

Mr. **Shamansky**. Yes.

Mr. **Weber**. If I can voice a little disagreement with my colleague—and trying to separate ourselves for a moment from the admittedly emotional case that we have investigated here this morning—there are hundreds and hundreds of areas of federally funded or sponsored scientific research going on. All of them subject to one form of guideline or another, and I am sure that my colleague is not suggesting that in all those cases we need a very careful policing to make sure that those scientists are not out there doing something they should not be.

Mr. SHAMANSKY. Oh, no. What I am suggesting is that from Dr. Raub's testimony it is clear that it is simply a paper trail that they have established. As long as the paper is unruffled, it's OK.

Mr. WEBER. I thank my colleague for yielding. I understand that, but I think that where federally funded research projects are involved, the only alternative to that would seem to be some form of an academic or a scientific search-and-destroy mission.

Mr. SHAMANSKY. No, not a search-and-destroy. If my profession as a lawyer can have an effective means of policing itself—we have investigators, at least in Ohio. I don't know about Minnesota; I assume they do, too.

Mr. WEBER. A somewhat superior system, I am sure.

Mr. SHAMANSKY. I am sure, undoubtedly. [Laughter.]

But the fact is it is a system, and basically what we have here is a nonsystem hiding behind a paper curtain. And I came to this hearing determined that we must have animal experimentation. Your testimony does not change that. What I am concerned about is your Institute. And I, frankly, am quite concerned about the needs of your Institute to have a better performance. It is a bureaucratic failure that I see here, which is an unfair reflection upon scientific research.

The problem to me is not scientific research. The problem here is your Institute.

Thank you, Mr. Chairman.

Mr. WALGREN. Thank you, Mr. Shamansky.

The Chair would recognize Mr. Weber.

Mr. WEBER. Thank you very much, Mr. Chairman.

I do not want to belabor the point that we just touched on, but I would like you to follow it up a little, Dr. Raub.

Do you feel that the Institute has been negligent in not policing its experiments more carefully?

Dr. RAUB. I do not believe it has been negligent, Mr. Weber. We developed over the years what we believed then and believe now is a cost-effective approach to identifying and acting upon the aberrations without subjecting the conduct of research to unnecessary constraints.

The fact that an incident like the one we have discussed this morning could occur is troublesome, and I have no excuse or remedy to offer. We believe that further steps, as described in my testimony, are indicated and appropriate to give us all the basis for deciding where the new dividing line should be between our general administrative activities and some regulatory or regulatory-like role. We will take that seriously, including the criticisms that have been offered this morning.

Mr. WEBER. We may have covered this ground, but how many NIH-funded laboratories are there around the country?

Dr. RAUB. Approximately 650.

Mr. WEBER. And would you care to venture a guesstimate as to how many individual experiments may be going on at any given time?

Dr. RAUB. The NIH funds on the order of about 20,000 or more active projects each year. The bulk of our funding is in the form of 18,000 research grants of various kinds, supplemented by over 1,000 research contracts and a few other awards.

Mr. **Weber**. I presume that it would take a substantial increase in the funding of NIH's administrative bureaucracy to more closely police all those experiments?

Dr. **Raub**. If we were to do direct monitoring on a frequent basis of every institution and every project involving animals, yes, sir, it would be a considerable cost.

Mr. **Weber**. I have one other line of questioning I would like to pursue with you, and I frankly do not expect that you are going to be able to answer it.

It seems that much of what we have discussed here this morning involves the suffering of the animals, and I have a feeling, in fact, that this is the entire issue here. And I wonder, for what may appear to be an obvious yet somewhat elusive question, how do you define and quantify suffering in the animal that is being experimented upon?

Does that appear anywhere in your guidelines? Does NIH make any attempt to establish criteria for what constitutes suffering or undue suffering on the part of an animal that is being subjected to experimentation?

Dr. **Raub**. There is no provision in the guidelines to attempt to quantify pain or suffering. My colleague, Dr. Held, has been associated over the years with the development of those guidelines, and I would ask him to elaborate.

Dr. **Held**. Unfortunately, pain and suffering in animals probably is not quantifiable. I would like to point out, however, that in the bulk of biomedical research using animals, there is no pain or suffering.

Animals are put on tests of feeding various compounds over a long period to see whether or not they may have a higher incidence of tumors or not, say in one kind of testing. And in much of the biomedical research that is done, it is a matter of obtaining cells, doing those kinds of manipulation, that in my view are not pain or suffering.

Now, one could argue that when you put a needle in an animal's vein to take a blood sample or you give them an injection of a compound, that that is pain, and indeed, I guess in one sense you could consider it such. But basically I don't believe that there is unacceptable pain and suffering, in most of the animals used in research.

We do recognize in our principles that occasionally there are some kinds of studies where you do have to carry out the study with pain, and we require in our guidelines and in our principles that animals which are going to undergo painful experimentation will be either anesthetized or they will be administered an analgesic. Only in rarely exceptional cases where that would interfere with the aims of the experiment itself is that permitted—a very small proportion of the cases of research using animals.

Mr. **Weber**. An acceptable level of suffering is entirely a subjective matter and pretty much left to the whims of the experimenter, is that correct?

Dr. **Held**. In many of the institutions the Animal Care Committees—and I would like to make this point, that the Animal Care Committees in many of our institutions do function very well and they are an excellent system of peer review and evaluation. They do go over individual protocols looking at questions such as: Are animals really needed for this experiment? Is a species being proposed really appropriate? Are the numbers appropriate? Are the techniques appropriate? When there is an experiment proposed which would entail pain or suffering, without its being alleviated, many institutions require those Committees to review those particular instances, and they would not approve it, I am convinced, unless there were really a justifiable reason for doing so.

Mr. **Weber**. Mr. Chairman, I just would make the point that it seems to me the most difficult issue that we face in considering this legislation is the fact that what is an acceptable level of suffering is almost entirely a subjective matter. Your opinion may differ from mine or from Dr. Raub's, and coming to grips with that is a very difficult thing in my opinion.

If we are going to establish, as one of the previous witnesses seemed to indicate, some kind of definition of suffering for animals, then we probably could not even cage an animal. We would consider that an inhumane treatment.

I do not know what the answer is, but this is probably the most difficult question this subcommittee faces.

I have no further questions.

Mr. **Walgren**. It strikes me that you have put your finger on a basic problem, and yet even the legislation that has been proposed by other Members of Congress, falls back on the peer review system for that determination to be made, and my instinct is that the scientific community accepts that kind of determination.

Our problem is that in certain instances the peer review system has not functioned and the question is, how can we get that peer review system to function, and I do feel that that may be beyond the power to legislate, per se.

That is not to say that some changes in this area cannot be made, and we will be exploring them legislatively. But what troubles me is Mr. Shamansky's point, that in sense of the functioning of the peer review system that we already have, that has to be secured by an administration by NIH, and that has not happened.

My question is: Even though Dr. Held testifies that in most instances these peer review committees in your view do function well, what is it that leads to their failure, and is there anything that we can do as the funding source and therefore the responsible source of these experiments, to make sure that we and the public are assured that these committees are functioning?

Now, if you would like to respond to that I would give you an opportunity, and I would also like you to think about it and perhaps there is some more specific suggestion you would feel comfortable making on reflection. While the testimony did not go into why this Animal Care Committee did not function, you indicated, Dr. Raub, that you had no remedy to offer in response to Mr. Shamansky—there must be a remedy in there someplace.

Maybe I am too optimistic, but when this is the alternative, there must be a remedy to the nonfunctioning of these Animal Care Committees and a remedy that would not violate any Member of Congress that would be sensitive to "overregulation."

Would you like to make a response to that at this point?

Dr. RAUB. Just that we are strongly committed, as I know you are, Mr. Chairman, to exploring that question. If we today thought we had a fail-safe remedy, we would have proposed it. We recognize the gravity of the particular incident as well as the disturbing possibility that it might be representative of at least a few other laboratories, and we will be working as hard as we can to deal with that.

Mr. WALGREN. If I could just suggest and ask you to consider what the makeup of these committees should be. Are they too much in-house? What burden is put on the individual member by the NIH to independently carry out these duties?

You know, lawyers have a fiduciary obligation to the judge never to misrepresent and in fact to come forward with any evidence that might come to their attention that something is not right. And certainly the same kind of obligation, I would believe, would be able to be placed on individual members if we did so.

But looking at the makeup of the Animal Care Committee in this institution, there is every reason to believe that none of these people would have come forward with anything. In fact we, as the NIH, as I understand it in our setting up of the system have not even expressly put on them that responsibility, but rather simply accepted some names that were submitted.

Well, perhaps I am being unfair, and I do not want to be unfair, but I do want to underscore that this was a failure of a committee which I think you could see would fail, looking at the makeup of it.

Your testimony went to the kinds of questions that are asked by the peer review system in approving the experiments in the first place, and in that testimony you indicated that they do ask themselves, does the envisioned experimental procedure indicate all reasonable precautions will be taken to prevent undue suffering by animals?

You said that the preface to that was, "particular research protocols regularly are subject to more specific questions such as," and then went into that. Does that mean that all research protocols are asked that question? And, if so, how is that question asked, and in what formal framework is it raised? And are there literally signoffs by the people who are involved in the peer review that they have grappled with that particular question in the process that NIH goes through?

Dr. RAUB. The procedure that we have followed to date, Mr. Chairman, is to insure that each member of a peer review team, especially what we call the initial review groups, commonly known as the study sections, has as part of his or her instructions the minimum set of questions associated with the use of animals. The responsibility rests with the individuals who are assigned to lead the discussion of each application, as well as with the NIH staff member, to see to it that all the questions are raised properly and then answered.

One of the procedural shortcomings that I mentioned in my testimony is that many times when everything is adjudged to be just fine there is not the explicit documentation of either the nature or the extent of that discussion, whereas almost invariably when a real or potential problem is identified there is a documentation of it, but not always in the place one would automatically look or in the form and the extent one would like to have, in retrospect.

Those who have worked closely with the system are basically satisfied that the overall function is sound but believe we could go a long way toward improving our overall management and assuring members of the public by providing a more systematic and regular documentation of that.

Mr. **Walgren**. Let me just ask, do I read between the lines that a peer review results ultimately in the signoff of the individual charged with leading the discussion and that the other partners in the peer review committee are sort of, as a matter of record keeping and formal endorsement, silent partners?

Dr. **Raub**. No, sir. Whenever a peer review group takes an action, it is a vote of the total body. As a matter of efficiency and convenience, we ask individual members to initiate and lead discussion on particular applications, but the judgments are that of the group.

Mr. **Walgren**. In the process do they in fact as a group then sign off on the question of whether or not there will be suffering and the answer to the question of whether that suffering is avoidable or undue?

Dr. **Raub**. In the case where the group has identified a concern there typically will be part of the written record a note providing its observations and findings, and perhaps suggesting some follow-up action that might be taken. And when that is the case the action is that of the full group, even though one of the members may have initiated the discussion of it.

Conversely, when everything is adjudged to be satisfactory there may or may not be explicit notification of that in the written record of the group action.

Mr. **Walgren**. I would be interested in whether or not you can make any suggestion and whether or not the peer review process in this particular original approval should be strengthened with respect to the judgment made about suffering.

I think most people would accept that scientists involved in the area have a positive attribute in that they are more knowledgeable and perhaps can make a better judgment about the necessity of various research. At the same time I think it is also fair to say that many scientists do become desensitized to what might be a more proper judgment about suffering.

I think the example of that in this case is we have the scientist who was the head of the Animal Care Committee and caring for monkeys, having on his desk a monkey's hand severed and apparently made into some kind of a paperweight or desk decoration.

Now, under those circumstances, is there any suggestion you can make about how we could be certain that the question of suffering is clearly focused on by the peer review committee and dealt with in a way that we know each of those people involved have come to the best judgment that they can render?

Dr. **Raub**. Mr. Chairman, it is my belief that the system is already strong in that regard and will become stronger as we focus specific and continuing attention on this issue to insure that it gets full discussion and to insure the satisfactory documentation of it.

Mr. **Walgren**. Well, let us look at this statement that the system is already strong. You indicate that the question of suffering is raised when members of the committee raise that in their discussions.

Is it required that a written track of that problem be made when that factor is raised in the discussion?

Dr. **Raub**. When a problem is raised, it is almost invariably the case that it is just part of the normal documentation of the review there would be such a written record and often some followup action required.

Mr. **Walgren**. How does somebody—If you were to select me as a lead discussion person in one of these reviews, is there a manual that I would go to that would tell me that a written record must be made of the question of suffering when it is raised as a factor in the process, or are we going on faith here again?

Dr. **Raub**. There are two sets of written guidelines. The one that I mentioned earlier is the instructions provided to each peer reviewer as he or she is appointed to a committee for service; the other is the detailed set of instructions for our own staff member, the so-called executive secretary, who is responsible for the management of the committee.

Those written guidelines do not guarantee that in every instance everything would be documented as cleanly as you and I might like to see.

Mr. **Walgren**. Well, leaving aside as you and I might like to see, do they require that it be documented at all?

Dr. **Raub**. When there is perceived to be a problem, yes, sir.

Mr. **Walgren**. So if one member of the committee raises his hand and says, "I think there is suffering involved here," it is required under the written guidelines of the peer review manual that that fact be noted and that be made a part of the record? Is that your understanding?

Dr. **Raub**. That is our regular procedure, yes, sir.

Mr. **Walgren**. I am not talking about procedure. I am talking about assurances that something is going to happen, that something will happen because it is part of the formal instructions that are given to a peer review group, rather than simply relying on them knowing our "procedures."

Well let me leave the record open at this point, and if you would submit to me the written instructions that are given to peer review committees which would designate whether or not they are required to make a written record of reservations expressed about suffering.

Dr. **Raub**. I would be glad to do that.

[The information follows:]

Excerpts from "Orientation Handbook for Members of Scientific Review Groups" including guidelines on animal welfare

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NIH also relies on its SRGs and Councils to evaluate all applications and proposals involving human subjects for compliance with human subject regulations (Code of Federal Regulations, title 45 part 46).

" 'Human subject' means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information. 'Intervention' includes both physical procedures by which data are gathered (for example, venipuncture) and manipulations of the subject or the subject's environment that are performed for research purposes. 'Interaction' includes communication or interpersonal contact between investigator and subject. 'Private information' must be individually identifiable, so that the identity of the subject may readily be ascertained by the investigator or associated with the information."

" 'Research' means a systematic investigation designed to develop or contribute to generalizable knowledge."

" 'Minimal risk' means that the risks of harm anticipated in the proposed research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests."

The Department will fund research covered by the regulations only if the institution has filed an assurance with the NIH Office for Protection from Research Risks (OPRR) and has certified that the research has been approved by an institutional review board (IRB) and is subject to continuing review by the IRB. When research involves only minimal risk and meets certain other conditions, the IRB may waive the requirement for obtaining informed consent. When research is exempt from the regulations, as provided under 45 CFR 46.101(b), adherence to ethical standards and pertinent laws is still required. The initial review is expected to reflect the collective standards of the professions represented within the SRG membership.

The evaluation by SRG members will take into consideration the risks to the subjects, the adequacy of protection against these risks, the potential benefits of the proposed research to the subjects and others, and the importance of the knowledge to be gained. Based on the evaluations of its members, the SRG may:

- recommend approval of the activity without restrictions;
- recommend approval of the activity, but record expressions of concern to be communicated to the institution and the principal investigator;
- recommend limitations on the work proposed, the imposition of restrictions, or the elimination of objectionable procedures involving human subjects;
- recommend disapproval of the application if the research risks are sufficiently serious and protection against the risks so inadequate as to consider the entire application unacceptable; or
- recommend deferral for resolution of SRG concerns for human subjects protection.

Any concerns which SRG members may wish to express regarding the adequacy of the protections afforded human subjects should be discussed in a separate paragraph entitled "Human Subjects" at the end of the "Critique." No awards will be made until all expressed concerns about human subjects have been resolved to the satisfaction of the NIH. Specific concerns and policy interpretation requests may be addressed to the Office for Protection from Research Risks which is responsible for the administration and interpretation of DHHS policy and regulations for the protection of human subjects of research.

The materials listed in Appendix B may be useful guides in evaluating proposals involving human subjects.

Animal Welfare. Although the recipient institution and investigator bear the major responsibility for proper care and use of animals, NIH relies on its staff, SRGs and Councils to review research activities for compliance with the PHS policy for the care and use of laboratory animals. Care and use of vertebrate animals in funded projects must conform to applicable law and PHS policy. The general intent of the law and policy can be summarized as two broad rules.

- The project should be worthwhile and justified on the basis of anticipated results for the good of society and the contribution to knowledge, and the work should be planned and performed by qualified scientists.
- Animals should not be confined, restrained, transported, cared for, and used in experimental procedures in a manner to inflict any unnecessary discomfort, pain, or injury.

Reference materials listed in Appendix B are important aids to this review of projects involving the use of animals.

For projects involving animals, the species used must be separately identified at the end of the "Description." Any concerns which SRG members may wish to express regarding the treatment and welfare of research animals used in the project should have "Animal Welfare" as a Special Note and the Animal Welfare paragraph explaining the concerns, after the "Critique." Questions may be directed to the Office for Protection from Research Risks.

With regard to the above policies concerning human subjects protections and animal welfare, no award may be made unless the applicant institution has given the NIH Office for Protection from Research Risks an acceptable assurance of compliance with the PHS policy and all concerns or questions raised by the SRG have been resolved to the satisfaction of the NIH.

Hazardous Research Materials and Methods. The investigator and the sponsoring institution are responsible for protecting the environment and research personnel from hazardous conditions. As with research involving human subjects, reviewers are expected to apply the collective standards of the professions represented within the SRG in identifying potential hazards such as inappropriate handling of oncogenic viruses, chemical carcinogens, infectious agents, and radioactive or explosive material.

If applications pose special hazards, these hazards must be identified and any concerns about the adequacy of safety procedures must be highlighted in the "Critique."

No awards will be made until all concerns about hazardous conditions have been resolved to the satisfaction of the NIH.

In the case of research with recombinant DNA, assessment of an applicant's compliance with DHHS guidelines is the responsibility of the NIH Office of Recombinant DNA Activites (ORDA). Although the SRG is not required to assess compliance of recombinant DNA research with NIH guidelines, an application that involves hazardous conditions should be so reported.

Reviewers' Recommendations

Reviewers may recommend that a grant application be approved, disapproved, or deferred.

Approval:	Based on the relevant review criteria, the application is of sufficient merit to be worthy of support. (The specific review criteria for the major types of grants are described in a later section.) A vote for approval is equivalent to a recommendation that an award be made provided sufficient funds are available. The recommendation can be for the time and amount requested or for an adjusted time and amount. A priority rating is required.
Disapproval:	The application is not of sufficient merit to be worthy of support. Disapproval may also be recommended when gravely hazardous or unethical procedures are involved, or when no funds can be recommended, such as in the case of a supplement deemed to be unnecessary. No priority rating is required.
Deferral:	The SRG cannot make a recommendation without additional information. This information may be obtained by telephone, by a project site visit, or by the submission of additional material by the applicant. Deferred applications are not presented to Councils and are usually reviewed again at the next SRG meeting.

If additional information from the applicant is needed, reviewers should inform the executive secretary well in advance of the meeting to decrease chances for a deferral. Reviewers must not contact an applicant directly. All communications with applicants must be handled by the official representative of the granting agency, in this case the executive secretary of the SRG.

For some proposals, a reviewer may feel that opinions should be obtained from specially qualified experts who are not members of the SRG. Upon request, the executive secretary will seek mail opinions from other experts. Such requests should be made as promptly as possible so that outside opinions will be received in time for the meeting of the SRG.

Preliminary comments should be sent to the executive secretary's office as early as possible so that the executive secretary can read all reviews and be aware of any major difficulties or differences of opinion. Moreover, if questions have been raised, the executive secretary can often obtain answers before the meeting.

Meetings of the Scientific Review Group

SRGs normally meet three times a year for two or three days each time, depending upon the number and types of grant applications to be reviewed. A DRG study section, which is generally responsible for the review of research project grant applications, may review between 75 and 100 applications at each meeting. Each member may therefore be asked to prepare detailed written critiques on a dozen or more applications. An Institute SRG, which is usually responsible for the review of special-purpose, multidisciplinary applications, such as for program projects and centers, reviews fewer applications at each meeting. The complexity of many of these applications may, however, impose other requirements.

Excerpts from "Handbook for Executive Secretaries," prepared by Scientific Review Branch, DRG, including animal welfare guidelines.

Any concerns by Study Section members for the adequacy of the protection or welfare of human subjects are indicated as a special note on the summary statement. This paragraph should fully list the reviewers' concerns on the adequacy of protection of human subjects with explanations, and indicate whether there was a unanimous consensus on the concerns. No award will be made until all expressed concerns about human subjects have been resolved to the satisfaction of the NIH.

Additional details can be found in Manual Issuance 4107: Review of Applications and Award of Grants Involving Human Subjects, and the summary of this Manual Issuance (Appendix B, pages B-60 to B-85).

D. ANIMAL WELFARE

Although the recipient institution and investigator bear the major responsibility for proper care and use of animals, NIH staff, Study Sections, and Councils share this responsibility. Care and use of vertebrate animals in funded projects must conform to applicable law and PHS policy, especially the Principles for Use of Animals. The general intent of these principles can be summarized as two broad rules:

- The project should be worthwhile and justified on the basis of anticipated results for the good of society and the contribution to knowledge; and the work should be planned and performed by qualified scientists.
- Animals should be confined, restrained, transported, cared for, and used in experimental procedures in a manner to avoid any unnecessary discomfort, pain, or injury.

Institutions are required to establish a mechanism, either through a committee or the American Association for Accreditation of Laboratory Animal Care, to monitor their animal care programs.

For all research grant applications involving vertebrate animals, the Executive Secretary should identify the species at the end of the Description or Research Plan section of the summary statement. If the Study Section determines that the investigator may not be in compliance with PHS policy or related principles, a brief notation, such as "Animal Subjects; Questionable Procedures," should be entered as a Special Note in the summary statement. The concerns and opinions expressed by the Study Section should then be described in a separate paragraph in the text of summary statement under the heading "Animal Welfare." A copy of the summary statement and the application should be forwarded to the OPRR.

The responsibility for further action rests with the awarding program staff, who will attempt to resolve questions raised during the Study Section review. No award will be made unless the applicant has given the OPRR an acceptable assurance of compliance with the PHS policy and all concerns or questions raised by the Study Section have been resolved to the satisfaction of the NIH.

IX. Areas of Special Concern

Additional details can be found in Manual Issuances 4206 and 6000-3-4.58: Responsibility for Care and Use of Animals (Appendix B, pages B-129 to B-139), a summary statement on "Public Health Service Policy on Humane Care and Uses of Animals" (Appendix B, pages B-140 to B-147), and a resolution adopted by the National Advisory Eye Council regarding experimental research with cold-blooded vertebrates (Appendix B, pages B-148 to B-150).

E. HAZARDOUS RESEARCH MATERIALS AND METHODS

The investigator and the sponsoring institution are responsible for protecting the environment and research personnel from hazardous conditions. As with research involving human subjects, reviewers are expected to apply the collective standards of the professions represented within the Study Section in identifying any potential biohazards, for example inappropriate handling of biohazardous materials, such as oncogenic viruses, chemical carcinogens, infectious agents, and radioactive or explosive materials.

If applications pose special hazards, the Executive Secretary should identify the potential or actual hazards in the summary statement under the heading "Biohazard," and, if appropriate, suggest how the investigator might avoid or deal with the problem. To bring the hazard to the attention of the NIH staff, the word "Biohazard" should be inserted after "Special Note" in the top heading of the summary statement.

No award will be made until all concerns about hazardous conditions have been resolved to the satisfaction of the NIH.

In the case of research with recombinant DNA, assessment of an applicant's compliance with DHHS guidelines is the responsibility of the NIH Office of Recombinant DNA Activities (ORDA). Although the Study Section is thus not required to assess compliance of recombinant DNA research to NIH guidelines, an application that involves hazardous conditions should be so reported in an administrative note on the summary statement.

F. PRIVACY ACT

The Privacy Act of 1974 (Public Law 93-579) is designed to safeguard individuals from invasions of personal privacy by Federal agencies. This legislation permits individuals named in Federal records to:

- determine what records pertaining to them are maintained by and used in a Federal agency;
- prevent their records from being used for any purpose other than the intended one(s) without their permission;
- gain access to their records; and
- ascertain that the information concerning them is accurate.

"Review Procedures for Initial Review Group (IRG) Meetings"
(Distributed to members at each meeting) For guidelines on
animal welfare, see pp. 4, 5.

REVIEW PROCEDURES FOR INITIAL REVIEW GROUP (IRG) MEETINGS

CONFLICT OF INTEREST

To avoid possible conflicts of interest, consultants must leave the meeting room when applications involving their own organizations are being discussed. In the case of state higher education or other systems with campuses that are geographically separated, the term "own organization" includes the entire system in which the consultant is an employee, consultant, officer, director, or trustee or has a financial interest. The entire system for a state university includes all the state institutions.

Consultants are also asked to absent themselves from the room during the review of any application if they feel their presence would constitute a professional or personal conflict of interest.

At the end of the meeting, the Executive Secretary obtains written certification from all consultants that they have not participated in the discussion of any application that would involve a conflict of interest.

CONFIDENTIALITY

All materials pertinent to the applications being reviewed are privileged communications prepared for use only by consultants and NIH staff. Consultants are requested to leave all review materials with the Executive Secretary at the conclusion of the review meeting.

Under no circumstances should consultants advise either investigators or their organizations of recommendations or discuss the review proceedings with them. The investigator may be led into unwise actions on the basis of premature or erroneous information. Such advice also represents an unfair intrusion into the privileged nature of the proceedings and invades the privacy of fellow consultants serving on review committees and site visit teams. A breach of confidentiality could deter qualified consultants from serving on review committees and inhibit those who do from engaging in free and full discussion of recommendations.

COMMUNICATIONS WITH INVESTIGATORS

Except during site visits, there should be no direct communications between consultants and investigators. Consultants' requests for additional information and telephone inquiries or correspondence from investigators should be directed to the Executive Secretary who will handle all such communications.

Rev. 6/1/81

IRG REVIEW

The IRG evaluates the merit of each grant application being reviewed by the group, according to specific criteria. The principal criteria for the initial review of research grant applications*, as required in the Public Health Service Scientific Peer Review Regulations, include:

- scientific, technical, or medical significance and originality of the goals of the proposed research;
- appropriateness and adequacy of the experimental approach and methodology to be used;
- qualifications and experience of the principal investigator and staff in the area of the proposed research;
- reasonable availability of resources necessary to the research;
- reasonableness of the proposed budget and duration in relation to the proposed research; and
- where an application involves activities that could have an adverse effect upon humans, animals, or the environment, the adequacy of the proposed means for protecting against or minimizing such effects. (See page 3.)

During the meeting, the Chairperson of the IRG, following an agenda prepared by the Executive Secretary, introduces each application, calls upon the individual assignees to read their written comments, and invites discussion. At an appropriate time, the Chairperson requests a motion on the application. The possible motions can be for approval, disapproval, or deferral.

- Approval: The application is of sufficient merit to be worthy of support based on the appropriate review criteria. A vote for approval is equivalent to a recommendation that a grant be awarded provided sufficient funds are available. A priority rating is required.
- Disapproval: The application is not of sufficient merit to be worthy of support. Disapproval may also be recommended when gravely hazardous or unethical procedures are involved, or when no funds can be recommended, as in the case of a supplement deemed to be unnecessary. No priority rating is required.
- Deferral: The IRG cannot make a recommendation without additional information. This information may be obtained by a project site visit or by the submission of additional material by the applicant. Deferred applications are usually reviewed again at the next IRG meeting.

* The specific review criteria will vary with other types of applications such as for National Research Service Awards (fellowships), Research Career Development Awards (RCDAs), or program project grants.

After a motion of approval, disapproval, or deferral has been seconded, the Chairperson asks for any further discussion. The Chairperson then calls for the question, and the IRG votes on the motion. The recommendation of the IRG for each application is made by majority vote.

If the vote is for approval, the budget is discussed. The budget recommendation, which can be for the time and amount requested or for an adjusted time and amount, should include not only the first year but also each subsequent year.

Split Vote

If two or more members disagree with the recommendation of the IRG, the dissenting members must prepare a written minority report.

Priority Rating

For each application that has been recommended for approval, each member of an IRG records on a green worksheet a numerical rating that reflects a private opinion of the merit of the application. The numerical rating ranges from 1.0 (the most meritorious) to 5.0 (the least meritorious) with increments of 0.1. Based on years of experience, a rating of 2.5 can be considered to represent average quality. The priority rating pertains to the recommended, not the requested, budget and duration of support.

If the vote for approval is not unanimous, reviewers who vote for disapproval should record a priority rating, which may be, but need not be, 5.0. In the case of a split vote, if a reviewer voting for disapproval does not choose to assign a priority rating, the staff will record a rating of 5.0.

Research Involving Human Subjects

Safeguarding the rights and welfare of human subjects involved in research activities supported by DHHS is primarily the responsibility of the institution that receives or is accountable to DHHS for the funds awarded for support of the research activities. However, NIH also relies on its IRGs and National Advisory Councils or Boards to evaluate all applications and proposals involving human subjects for compliance with human subject regulations (Code of Federal Regulations, title 45, part 46).

"'Human subject' means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual, or identifiable private information. 'Intervention' includes both physical procedures by which data are gathered (for example, venipuncture) and manipulations of the subject or the subject's environment that are performed for research purposes. 'Interaction' includes communication or interpersonal contact between investigator and subject. 'Private information' must be individually identifiable, so that the identity of the subject may readily be ascertained by the investigator or associated with the information."

"'Research' means a systematic investigation designed to develop or contribute to generalizable knowledge.

"'Minimal risk' means that the risks of harm anticipated in the proposed research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests."

The Department will fund research covered by the regulations only if the institution has filed an assurance with the NIH Office for Protection from Research Risks (OPRR) and has certified that the research has been approved by an institutional review board (IRB) and is subject to continuing review by the IRB. When research involves only minimal risk and meets certain other conditions, the IRB may waive the requirement for obtaining informed consent. When research is exempt from the regulations, as provided under 45 CFR 46.101(b), adherence to ethical standards and pertinent laws is still required. The initial review is expected to reflect the collective standards of the professions represented within the IRG membership.

The evaluation by IRG members will take into consideration the risks to the subjects, the adequacy of protection against these risks, the potential benefits of the proposed research to the subjects and others, and the importance of the knowledge to be gained. Based on the evaluations of its members, the IRG may:

- recommend approval of the activity without restrictions;
- recommend approval of the activity, but record expressions of concern to be communicated to the institution and the principal investigator;
- recommend limitations on the work proposed, the imposition of restrictions, or the elimination of objectionable procedures involving human subjects;
- recommend disapproval of the application if the research risks are sufficiently serious and protection against the risks so inadequate as to consider the entire application unacceptable.
- recommend deferral for resolution of IRG concerns for human subjects protection.

Any concerns which IRG members may wish to express regarding the adequacy of the protections afforded human subjects will be discussed in a separate paragraph in the summary statement. No awards will be made until all expressed concerns about human subjects have been resolved to the satisfaction of the NIH. Specific concerns and policy interpretation requests may be addressed to the Office of Protection from Research Risks which is responsible for the administration and interpretation of DHHS policy and regulations for the protection of human subjects of research.

Animal Welfare

Although the recipient institution and investigator bear the major responsibility for proper care and use of animals, NIH relies on its staff, IRGs and Councils to review research activities for compliance with the PHS policy for the care and use of laboratory animals. Care and use of vertebrate animals in funded projects must conform to applicable law and PHS policy. The general intent of the law and policy can be summarized as two broad rules.

- The project should be worthwhile and justified on the basis of anticipated results for the good of society and the contribution to knowledge, and the work should be planned and performed by qualified scientists.

- Animals should not be confined, restrained, transported, cared for, and used in experimental procedures in a manner to cause any unnecessary discomfort, pain, or injury.

Any concerns which IRG members may wish to express regarding the treatment and welfare of research animals used in the project will be discussed in a separate paragraph in the summary statement. Questions may be directed to the Office for Protection from Research Risks.

With regard to the above policies concerning human subject protections and animal welfare, no award may be made unless the applicant institution has given the NIH Office for Protection from Research Risks an acceptable assurance of compliance with the PHS policy and all concerns or questions raised by the IRG have been resolved to the satisfaction of the NIH.

Hazardous Research Materials and Methods

The investigator and the sponsoring institution are responsible for protecting the environment and research personnel from hazardous conditions. As with research involving human subjects, reviewers are expected to apply the collective standards of the professions represented within the IRG in identifying potential hazards, such as inappropriate handling of oncogenic viruses, chemical carcinogens, infectious agents, radioactive or explosive materials, or recombinant DNA. In the case of research with recombinant DNA, assessment of an applicant's compliance with NIH guidelines is the responsibility of the NIH Office of Recombinant DNA Activities (ORDA).

If applications pose special hazards, these hazards will be identified and any concerns about the adequacy of safety procedures highlighted as an administrative note in the summary statement.

Mr. **Walgren**. I had one other thought, which has escaped me. I want to apologize for having gone on too long.

Mr. Brown.

Mr. **Brown**. Mr. Chairman, I was just going to offer to let you collect your thoughts while I ask a question or two.

Dr. Raub, I am sure you recognize that it is not the best situation in the world to have to focus on an atypical or an unusual event of the sort that has been highlighted here this morning when we are really interested in a longer range problem which, as you know, has been the subject of work by this subcommittee for a number of years.

The symposium that you referred to last winter was merely a part of an ongoing process aimed at trying to, I guess you might say, raise the level of consciousness and seek some continuing evidence of progress in this area, and I trust that is your understanding of the underlying situation here.

Dr. **Raub**. Yes, Mr. Brown, it is.

Mr. **Brown**. In that light, your testimony gives evidence of some progress which we are pleased to see, and I note particularly your reference to more effective field inspection procedures and to improvements in documentation. I trust that if we raise these questions again in subsequent hearings in the future you would be able to report that there had been some developments of a beneficial nature as a result of this. Is that your hope, also?

Dr. **Raub**. Our hope and our intention, Mr. Brown.

Mr. **Brown**. You raise one point having to do with the need for a governmentwide forum which you have been discussing with the Executive Office of the President, Office of Science and Technology Policy. I would assume there have been some problems there, due to certain discontinuities in the Office, and you might not have been able to reach agreement, but may I assume you will continue with those discussions?

Dr. **Raub**. Yes, Mr. Brown, you may.

Mr. **Brown**. And I think this subcommittee would like to be able to occasionally ask you what kind of progress is being made there, and hopefully you can receive a favorable response from the Office with regard to instigating a kind of mechanism that you have referred to. We would like, I am sure in this committee, to lend our encouragement to that.

Dr. **Raub**. We would welcome the opportunity to explore it with you, at any time.

Mr. **Brown**. I do not think it would be presumptuous to say that if you wish to let the President's science adviser know that this committee is deeply concerned, we would not be offended by that, and I trust that he would take some favorable action on the matter.

The key area that I think we will need to see continued work on is, as was included in the recommendations that came from the symposium: additional funding of research alternatives to animal experimentation, that is, other research methodologies that might produce the same result as effectively and with less need for animals.

Will NIH continue with this line of support for research in the future?

Dr. **Raub**. We expect to continue with several aspects of that line of research.

In the more specific sense of replacement of animals used in testing, a continuing focus of the national toxicology program will be the search for better, cheaper, and a faster means to carry out the testing of potentially toxic substances, and it is inevitable that the major payoffs ultimately will be found in nonanimal systems, such as the bacterial systems that several of us have mentioned this morning. That will continue as an overt effort.

In addition, as a byproduct, if not a direct product, of most of our basic science, comes the insights and the concepts and the understandings and the techniques that are drawn upon by people interested in the testing milieu.

While the majority of our basic science projects by definition are not directed toward finding substitutes for animals, it is inevitable that the insights that come about on basic biology, especially at the cellular and molecular level, will have application in those arenas.

One reason NIH is so strongly interested in the governmentwide forum is to have a further means to identify the problems and the needs of regulatory agencies and the commercial organizations and to provide the kind of research knowledge that is the regular product of NIH in support of that end.

Mr. **Brown**. Dr. Raub, I have never expected that we would achieve final solutions in this area in any near-term framework, but I do assume that we can continue to make progress.

Now, unfortunately, the kind of progress we need is not always measurable. It consists of changes in attitudes of perhaps certain people within the scientific community as well as outside the scientific community; and the way we are going to judge progress is not going to be on measurements of changes in attitude—that is very difficult—but on more mundane things like the effectiveness of your inspection procedures or your documentation or how much money you are spending on alternative forms of research. It would be my hope that you will be able to show a continued strong effort in these areas so that we may have some indicators at least that we have not come up against a roadblock to additional progress in this area.

Mr. Chairman, I have no further questions.

Mr. **Walgren**. Thank you, Mr. Brown.

Just to finish, Dr. Raub, I wonder whether or not there is any way that we can work against the bureaucratic momentum of a laboratory, such as the Silver Spring laboratory that may be doing some experiments, but after awhile there is evidence that they were piggybacking other kinds of research on NIH-funded research in hopes of finding something interesting in order to get more money. In fact, they were looking to employ themselves from the taxpayer's dollar through a fishing expedition that involved quite a bit of wrongful activity. And it does not seem that there is any formal way other than the peer review system to make sure that does not happen.

Is that your impression?

Dr. **Raub**. By the peer review system were you referring to the local committee or the central NIH committees?

Mr. **Walgren**. Well, I guess both would be related here. The NIH committee would fund the research originally, and the local committee would be aware of piggybacking of fishing-expedition research.

Dr. **Raub**. There are two aspects to that question, Mr. Chairman, I would like to address.

First, with respect to the committees and their functions, my colleagues and I do not now foresee a way other than the precise articulation of guidelines and various efforts to reinforce them and keep the consciousness of all participants very high to detect and better prevent incidents that none of us can condone.

The aspect of piggybacking experiments on an existing grant is an extremely complicated one. I will not attempt to judge the situation we were describing this morning. However, it is the regular intention of a research grant to allow a degree of discretion and flexibility to the principal investigator with respect to the research protocols that are carried out.

It is routine in our administration of grants that, if there is any exceeding of the boundaries of a grant, the grantee institution at the very least is subject to a disallowance of the funds it used in doing that, if not a more stringent penalty, depending on the activity that was undertaken. However, it is not surprising—and in fact it is typical—that an investigator will go beyond the precise letter of the grant application but still be well within the bounds of the scientific project that is addressed.

Mr. **Brown**. Will the gentleman yield to me at that point?

Mr. **Walgren**. I would be happy to yield.

Mr. **Brown**. I would like to just comment that Mr. Raub's statement is one which is borne out by much previous testimony to this subcommittee, and we should be extremely cautious here in attacking examples of piggybacking, because in many cases we have tried to encourage sufficient flexibility within the granting process so that we could get the benefit of some of this.

Some of our most eminent scientists in this country are noted for the fact that they do this sort of thing and it is the only way they think they can make an otherwise awkward system perform better than it might otherwise perform.

So, while it can be misused, and perhaps was in this instance—and I am not prepared to comment on that—I think we should not proceed along the line of attack on this practice without being very careful on the matter.

Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you, Mr. Brown.

Did the evaluation by NIH of IBR look at the kinds of research that was being carried out there, or was that revocation strictly on the condition of the laboratory?

Dr. **Raub**. In this case the revocation was based on the perceived failure in significant ways to fulfill the guidelines associated with the care and the handling of the laboratory animals. We took a suspension action primarily because we wanted to have as quick and as firm an NIH response as possible in this and similar cases, should they occur.

The suspension action keeps a dialog open between us and the institution involved, and our inquiry will continue on specific points. In addition, it gives us the opportunity to cooperate fully with the State's attorney and other authorities who are pursuing the possibility of court action in the matter.

We will be prepared to consider other actions as is needed once the various events with the court play out, as well as our continuing interactions with the institution.

Mr. WALGREN. Could you submit for the record a history, along with the actual approvals for research, given this particular institute for the past 10 years?

Dr. RAUB. Yes, sir, I could do that.

[The information follows:]

NIH Awards to Institute for Behavioral Research, Silver Spring, Maryland
FY 1972 - 1981

P.I.	Title	Grant Number	FY	Amount Awarded
Cohen, Harold L	General Research Support Grant	5S01RR05636-06	72	113,072
"	"	5S01RR05636-07	73	40,974
"	"	3S01RR05636-07S1	74	69,095
Parsons, H Mc Ilvaine	General Research Support Grant	5S01RR05636-08	74	71,399
"	"	5S01RR05636-09	75	55,266
"	Biomedical Research Support Grant	5S07RR05636-10	76	45,862
"	"	5S07RR05636-11	77	39,622
"	Biomedical Research Support	5S07RR05636-12	78	30,796
Rioch, David M	Biomedical Research Support	5S07RR05636-13	79	32,652
"	"	2S07RR05636-14	80	16,575
"	"	2S07RR05636-15	81	13,482
Taub, Edward	Fetal Origins of Primate Sensory-Motor Integration	1R01HD08579-01	74	72,780
"	"	5R01HD08579-02	75	76,273
"	"	5R01HD08579-03	76	72,726
"	"	3R01HD08579-03S1	77	7,496
"	Raynaud's Disease and Temperature Regulation	1R01HL21323-01	77	94,455

NIH Awards to Institute for Behavioral Research, Silver Spring, Maryland (Cont.)
FY 1972 - 1981

P.I.	Title	Grant Number	FY	Amount Awarded
Taub, Edward	Raynaud's Disease and Temperature Self-Regulation	5R01HL21323-02	78	94,524
"	"	5R01HL21323-03	79	99,619
"	Effects of Somatosensory Deafferentation	9R01NS16685-08A1	80	106,864
"	"	5R01NS16685-09	81	115,068

Mr. WALGREN. And do you have any records that would allow you to make a judgment that this kind of thing has not been done before or duplicated?

How does NIH keep its records so that you could assure me that this same kind of thing in terms of the goals of the research is not being done by another laboratory under another Federal grant?

Dr. RAUB. A regular part of the instructions offered to our peer reviewers and our peer review staff is to include considerations about the novelty if not the uniqueness or other special characteristics of the research as they attempt to establish its scientific merit. In many cases the peer reviewers will be specific that there is essentially no other laboratory pursuing this particular line of research or hypothesis.

In other cases the peer reviewers also will note explicitly that there are other laboratories with ongoing, similar interests but, nevertheless, recognize the importance in science of not only multiple perspectives on problems but also some modest level of redundancy in the interest of assuring that the data emerging from one laboratory indeed are reproducible elsewhere.

Mr. WALGREN. How do the peer reviewers get the information to make that judgment?

Dr. RAUB. One of the characteristics used in selecting peer reviewers is to identify individuals who are expert and therefore broadly knowledgeable in the fields in question. As part of their own regular fund of information that they bring to their own research they generally have the kind of information that is more than adequate for our particular needs.

Mr. WALGREN. Is there any particular search made other than relying on what they may recall for previous experiments?

Dr. RAUB. Do you mean such as formal literature searches or things like that? Only in exceptional cases, Mr. Chairman.

Mr. WALGREN. Does your peer review form require them to make this finding, that the research is not duplicative and is not done elsewhere?

Dr. RAUB. I do not recall the precise wording at this moment of those instructions. My recollection is, in general, that they are of the tenor of identifying what is special and what is unique and what is important about this line of research. Our instructions stop short of an explicit requirement that research not be duplicative.

Mr. WALGREN. I would like to think with you sometime about whether or not your efforts could be strengthened in that area.

Thank you very much, Dr. Raub. I certainly appreciate your patience with the committee and your information. I hope that in the future you will be able to come before the committee and not have to indicate that there were things that were unstated in the record that you would like to be able to state for certain. I would like to try to be helpful in any way I can to urge you to make sure that the record is complete so that no one has to rely on unstated affirmative approvals in instances like this.

We appreciate your testimony and will look forward to working with you on the problem and talking to you about it in the future.

Dr. RAUB. Thank you, Mr. Chairman.

Mr. **Walgren**. The next witness is Mr. James Lee, Jr., Associate Administrator of the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture.

Mr. Lee is accompanied by Dr. Dale Schwindaman, the Senior Staff Veterinarian of the Animal Care Staff of APHIS.

As I understand it, gentlemen, the Department of Agriculture had the responsibility to carry out oversight of what was happening in these laboratories. We welcome you to the committee and look forward to your testimony.

Your written statement will be made a part of the record. If you would summarize, or proceed however you feel you can best communicate to the committee we would appreciate it.

STATEMENT OF JAMES O. LEE, JR., ASSOCIATE ADMINISTRATOR, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE; ACCOMPANIED BY DALE F. SCHWINDAMAN, SENIOR STAFF VETERINARIAN OF THE ANIMAL CARE STAFF

Mr. **Lee**. Thank you, Mr. Chairman.

I may have misunderstood the purpose of the hearing this morning, and I came prepared to express the views of the Department of Agriculture on H.R. 4406.

Mr. **Walgren**. That will be helpful.

Mr. **Lee**. If I can ask for your indulgence I will proceed with my short statement.

I appreciate this opportunity to express the views of the Department of Agriculture on H.R. 4406, a bill "To amend the Animal Welfare Act to insure the humane treatment of laboratory animals."

With me today is Dr. Dale Schwindaman, on my right, who is the Senior Veterinarian on our Animal Care Staff.

The Department of Agriculture, as you probably are aware, through the Animal and Plant Health Inspection Service, administers the Animal Welfare Act. One of the objectives of the act is to insure humane care and treatment of certain warm-blooded animals intended for use in research facilities.

Facilities which use these animals for research, testing, or experiments must register with USDA. The registration requirement is one means of assuring that laboratory animals have the necessary veterinary care and creature comforts of adequate housing, handling, sanitation, food, water, and protection against extremes of weather and temperature during research and when transported.

The law and regulations are designed to leave researchers free to conduct any studies they consider necessary. However, these researchers must, wherever possible, use appropriate pain-relieving drugs during actual research or experimentation. In connection with this the research facilities must submit an annual report to the Secretary of the Department of Agriculture on the care and treatment of animals used in research, whether any painful experiments were conducted, and when pain-relieving drugs were not used during painful experiments.

Our regulations and standards of animal care for registered research facilities are enforced through regular inspections, action on alleged violations, and review of the annual reports on the appropriate use of pain-relieving drugs during experimentation on the animals.

As is true with most laws research facilities covered by the act are occasionally found in violation of the Department's regulations and standards of humane animal care and treatment. Violations are found through unannounced inspections of the premises of registered facilities, complaints of an interested public, and occasional news media articles and telecasts. Investigations are made to determine the facts. Once these facts are analyzed appropriate steps are taken to correct the situation.

Mr. Chairman, the bill the subcommittee is considering today extends coverage of the Animal Welfare Act to all animals intended for use in research facilities. Removal of the Secretary's authority to exempt certain institutions and Federal agencies from registration as research facilities, and to exempt certain species of animals intended for use in research, combined with the extension of coverage to include any live vertebrate creature, would have a great impact on the Animal Welfare Act. Clearly, the bill would greatly increase the Department's responsibilities and require expansion of our enforcement program. Accordingly, pending further analysis by the Department and other executive agencies we must oppose H.R. 4406. As soon as our review of this proposal is complete and following coordination with other executive agencies we will be pleased to provide the committee with a complete report on the bill.

Nevertheless, we do offer the following preliminary comments on this legislation:

The definition of pain, as indicated in earlier testimony, provided in the bill is perhaps a first step toward describing a very subjective experience. However, we do not think this definition of pain is workable. Our review of the reports submitted to us on experiments using animals shows that the lack of knowledge and uniformity concerning pain interpretation causes some significant problems for research facilities. Therefore, it may be desirable to include a definition of pain in the Animal Welfare Act, but only if its descriptive terms are specific.

We question changing the requirements for standards of care and treatment from "minimum" to "proper."

If we are correctly interpreting section 5 of the bill we would be required to develop standards considered to be "proper" for the different segments of the industry and various animal species covered by the act.

If this interpretation is correct we suggest that the term "proper" be qualified. For example, proper requirements with respect to the type of animal, the species, the use of the animal, its immediate environment, and certain other factors. However, Mr. Chairman, we do not favor adding "space for normal exercise" as a required standard of care and treatment because of the difficulty in making a determination on what exercise would be "normal."

The bill strengthens the roles and degree of control and review of the animal care committees and seems to include the design, outlines, guidelines, or performance of actual research or experimentation by a research facility. Because of the added responsibilities of the animal care committees and that we currently consult with and seek the advice of outside organizations and individuals administratively we feel that a statutory advisory committee is unnecessary. Also, we believe in the principle which argues for prohibition against the Secretary interfering in actual research, and therefore, would like to see the prohibition in section 13 of the act retained.

The provision in section 11 of the bill which would allow criminal sanctions to be imposed against research facilities in the same way as they may now be imposed against dealers, exhibitors, and operators of auction sales, is a logical extension of the criminal sanctions under the act. However, it should be noted that a "research facility" is not the type of entity which can be imprisoned. Therefore, we suggest that this section be revised to clarify where the actual criminal liability would lie in case of a knowing violation by a research facility.

Mr. Chairman, the Department—and I might add that I professionally and personally strongly support humane care and treatment of animals, and I am sure that I also speak for all of the APHIS personnel and we laud the objective of the bill before us, to insure humane treatment and care of laboratory animals.

However, for the reasons mentioned earlier we must oppose H.R. 4406.

Thank you, Mr. Chairman.

Mr. WALGREN. Thank you very much, Mr. Lee. We appreciate that.

Dr. Schwindaman, did you have a prepared statement?

Dr. SCHWINDAMAN. No, sir, I have not, Mr. Chairman.

Mr. WALGREN. Fine.

Mr. Lee, on this incident at Silver Spring—perhaps you are not in a position to say too much specifically about that incident, and I would understand that—but it is my understanding that the USDA did look at that facility recently and did not react to the conditions that were there, except to report very minor deficiencies and essentially say that not too much was wrong there. Can you tell the committee what happened there, whether USDA missed something, or would you normally expect to pick up that kind of a problem and be asking for its correction?

Mr. LEE. Mr. Chairman, I would like to qualify my answer if I may.

I understand from Dr. Schwindaman, who is our Senior Staff Veterinarian, that APHIS is responsible for approximately 2,500 research facilities in the United States for their registration and inspection. On the average with the personnel and funds that we have available to us the inspections themselves amount to about 1½ inspections per year.

Mr. WALGREN. One and a half inspections each year, for each of the 2,500 facilities?

Mr. LEE. One and one-half.

I would like to also beg the indulgence of the chairman in not specifically answering the question relating to the Silver Spring incident because in all probability the Department will become a party to the proceedings in court, and I am sure that you can appreciate that.

Mr. **Walgren**. I am amazed that you can conduct that many inspections per year. What is the budget commitment and the manpower commitment to that effort?

Mr. **Lee**. Dr. Schwindaman.

Mr. **Schwindaman**. For fiscal 1981 the total budget, gross budget, was $4.355 million. However, we must remember that our responsibility is not only with research facilities, but exhibitors, dealers, operators of auction sales, and other users of animals.

Mr. **Walgren**. Can you separate out the level of the effort that is related to the research laboratories inspections as opposed to what I gather would be the commerce aspect of the Agriculture Department?

Dr. **Schwindaman**. We have the data in man-years, total number of man-years because of our organizational and other efforts and other responsibilities. We have, during fiscal 1981, committed 47 man-years to field effort.

I am sorry, Mr. Chairman, I do not have the exact percentage that would be devoted to research facilities.

Mr. **Lee**. Mr. Chairman, we would be glad to furnish to the committee answers to any questions we may not have the information for at this time. If you would like that information furnished to the committee we would be glad to do it.

Mr. **Walgren**. I certainly would like that kind of a submission, and maybe you can look back at fiscal year 1980 in terms of man-years and financial resources committed to that responsibility.

Mr. **Lee**. What makes the answer so complex is that the Animal Plant Health Inspection Service administers 43 separate programs, and with 4,500 professionals divided among 43 separate programs it becomes difficult to give an off-the-top-of-the-head so to speak answer to the number of man-years that are dedicated to any particular program.

Mr. **Walgren**. I see. Well, I certainly do not want to create more work for the purposes of detail alone. If you can just make some rough estimate of how significant our effort in that area is, I would appreciate it.

Mr. **Lee**. We would be glad to.

[The information follows:]

FISCAL YEARS 1980 and 1981 MAN-YEARS AND FINANCIAL RESOURCES COMMITEED TO RESEARCH FACILITIES UNDER THE ANIMAL WELFARE ACT

	Man-years	Resources
Research facilities registered:		
1980	0.13	$5.096
1981	.15	5,880
Research facilities inspected:		
1980	4.23	165,816
1981	6.43	252,056

Mr. **Walgren**. You do the inspections, the Department does the inspections for the NIH, also, in this area; is that right?

Mr. **Lee**. Not necessarily. The parts of the Animal Welfare Act that assign responsibility to the Department of Agriculture for inspection are basically our responsibility. Now, Dr. Schwindaman might want to enlarge upon that.

Mr. SCHWINDAMAN. Specifically, Mr. Chairman, we do not conduct inspections on behalf of NIH. We have a very good cooperative relationship with NIH, in that if we find facilities that do not correct deficiencies we try usually to let them know which facilities these are.

Mr. WALGREN. Could we ask you to submit for the record your experience with this Silver Spring Laboratory? And, perhaps over the last four or five years when they were inspected and what was found; if you would submit the report itself to be made part of the record.

Mr. LEE. We would be glad to do that, Mr. Chairman.

[The information follows:]

The Hyattsville, Maryland, Veterinary Services Area Office files have been purged of all copies of inspection reports and most other records over 3 years old according to the APHIS Directives on recordkeeping. Therefore, this chronology of USDA involvement with the Institute for Behavioral Research (IBR), Silver Spring, Maryland, covering the inspections reports is limited to the period of February 13, 1978, to the present time.

According to recent communications with the National Institutes of Health (NIH), IBR has been receiving Federal moneys for about 15 years. The 1970 Amendments to the Animal Welfare Act, which were implemented in 1971, required research facilities using animals other than dogs or cats to register with USDA. IBR's research activities came to the attention of USDA in early 1977 due to a public complaint about the housing conditions of nonhuman primates being used for research purposes. The investigation revealed the complaint to be founded. IBR was registered, as the law does not require research facilities to be in compliance prior to registration. The deficiencies were apparently corrected. The following history has been developed from the records in the Area Office file.

February 23, 1977—IBR was registered as a research facility by APHIS following the initial contact when they were advised of their responsibilities under the Animal Welfare Act.

November 29, 1977—The VS Form 18-23, Annual Report of Research Facility, submitted by IBR showed 15 primates involved in research, tests, or experimentation which experienced no pain and 17 used involving pain but with the appropriate use of pain-relieving drugs.

February 13, 1978—APHIS compliance inspection with no deficiencies recorded.

November 13, 1978—Annual Report (see above) submitted showing 11 primates involving no pain and 13 primates with pain but with the appropriate use of drugs.

March 21, 1979—Compliance inspection with no deficiencies.

August 22, 1979—Compliance inspection with the following deficiencies noted: (1) Cleaning and Housekeeping—The area needs a through cleaning which should be done properly, and (2) Veterinary Care—One of the animals has lost its bandage after surgery and its wound is open. This should be corrected right away.

September 7, 1979—Compliance inspection showing the August 22 deficiencies corrected with no new deficiencies.

October 31, 1979—Annual Report submitted showing 22 primates used involving no pain.

November 25, 1980—Annual Report submitted showing 19 primates used involving no pain.

April 24, 1981—Compliance inspection with the following deficiencies noted in the monkey room: (1) Interior Surfaces—Tiles coming loose on the floor and needed to be replaced or floor renovated, (2) Sanitation—The loose tiles preclude the possibility of adequate sanitation, especially for postsurgical animals, and (3) Cleaning—the loose tiles make it impossible to clean the room adequately. These deficiencies should be corrected in 45 days. In the interim period, extra precautions are to be taken to sanitize the floor adequately

July 13, 1981—Compliance inspection with the April 24 deficiencies corrected and no new deficiencies noted.

September 11, 1981—IBR primates seized by the Montgomery County, Maryland, Police and removed from the premises.

September 15, 1981—Compliance inspection. Although no animals were on the premises, the following deficiencies were noted: (1) Structural Strength—install baseboard, quarter round, and repaint animal rooms, as necessary, (2) Housekeeping—shop and sheet metal room has accumulated trash on floor. Small storage closet in hall needs through cleaning, (3) Primary Enclosures—some sealing or paint or paint as previously done, and (4) Feed Storage—feed and bedding are stored in metal storage room and collect dust.

September 17, 1981—Compliance inspection showing the Septemebr 15 deficiencies corrected with no new deficiencies.

October 21, 1981—Compliance inspection with no animals present and no deficiencies noted.

Mr. WALGREN. In view of your involvement in the area do you have any suggestions as to how we could assure that conditions like this do not exist out there?

Mr. LEE. Yes. The Animal Plant Health Inspection Service conducts a continuous review and reassessment of all of its programs, including the animal welfare program. We are in the process right now of reassessing our position as far as our activities in animal welfare are concerned, and we should have that type of information applicable to a continual improvement of our role in animal welfare activities available within the next month or so.

And again, we would be glad to furnish that document to the committee, also.

[The information follows:]

Report of reassessement of APHIS activities relative to research facilities under the Animal Welfare Act.

As a result of the recent publicity surrounding the State of Maryland confiscation of monkeys at the Institute of Behavioral Research Silver Spring, Maryland, APHIS has made an indepth evaluation of activities relating to research facilities. In order to provide continued improvement in the administration of the animal welfare program, procedures are being revised, strengthened, and implemented in the following area: (1) training of inspection personnel, (2) revising agency policy memoranda and guidelines to be more detailed and specific to preclude misunderstanding, (3) in conjunction with (1) and (2), emphasize the provisions and responsibilities relating to adequate veterinary care, (4) increase the responsibilities of the facilities' attending veterinarian and/or animal care committee in reviewing the research protocols on the use of animals in research, (5) implementing an additional performance requirement under the Civil Service Reform Act to better ensure quality inspection by APHIS veterinary medical officers, (6) establishing a review and monitoring system which will "red flag" potential problem areas and "trigger" extraordinary action by specialized personnel, and (7) increasing liaison with Federal funding agencies to formalize procedures for suspending Federal funding to noncomplying research facilities. We believe these actions when completed, will further improve the effectiveness within available resources of APHIS enforcement of the animal welfare program and will maximize the humane care and treatment of research animals.

Mr. WALGREN. It is your instinct that the pictures you have seen here today would not pass muster of the USDA in its inspection program. Is that your opinion?

Dr. SCHWINDAMAN. Yes, sir, it certainly is. The pictures do not depict any compliance with the requirements of the Animal Welfare Act. The pictures per se do denote deficiencies of the Animal Welfare Act.

Mr. WALGREN. I see.

Well, we certainly appreciate your presence, and particularly your comments on the proposed legislation. We are going to be looking at that particular suggestion and others that have been proposed by other Members of Congress. I am sure that the committee will give weight to your reservations about how we can move in that area.

So, thank you very much for coming.

Mr. LEE. Thank you, Mr. Chairman.

Mr. WALGREN. The next witness is Dr. James Ebert, Vice President of the National Academy of Sciences.

Dr. Ebert will be accompanied by Dr. Franklin Loew, chairman of the Division of Comparative Medicine of Johns Hopkins University. Dr. Loew is also the Chairman of the Institute of Laboratory Animal Resources for the National Research Council.

We want to welcome you to the committee, gentlemen, and your written statements will be made a part of the record. Please proceed to summarize or communicate for the verbal record as you feel you would like.

Dr. Loew.

STATEMENT OF DR. FRANKLIN M. LOEW, DIRECTOR, DIVISION OF COMPARATIVE MEDICINE, THE JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE, AND CHAIRMAN, INSTITUTE OF LABORATORY ANIMAL RESOURCES, NATIONAL RESEARCH COUNCIL; ACCOMPANIED BY EARL W. GROGAN, EXECUTIVE SECRETARY, INSTITUTE OF LABORATORY ANIMAL RESOURCES, NATIONAL RESEARCH COUNCIL

Dr. LOEW. Thank you, Mr. Chairman.

I apologize for Dr. Ebert who is unable to be here today; I am accompanied by Dr. E. Wayne Grogan who is the executive secretary of the Institute of Laboratory Animal Resources.

I have heeded the instructions in your letter and have edited our written testimony to, I hope, no more than 5 minutes.

I am Franklin M. Loew, testifying today on behalf of the National Academy of Sciences, National Research Council in my role as Chairman of the National Research Council's Institute of Laboratory Animal Resources. I am also Director of the Division of Comparative Medicine at the Johns Hopkins University School of Medicine in Baltimore, Md.

I received a doctor of veterinary medicine degree from Cornell University and a Ph. D. degree from the University of Saskatchewan.

The National Academy of Sciences is a private, nonprofit organization created by a congressional charter signed by President Abraham Lincoln in 1863. The charter calls upon the Academy to serve as an official adviser to the Federal Government on questions of science and technology.

Further objectives of the National Academy are to stimulate research and its application, survey the broad potentialities of science and technology, promote effective utilization of the scientific and technical resources of the country, and advance the general interests of science.

The National Research Council was established in 1916 and is the principal instrument through which the National Academy discharges the fundamental responsibility embodied in its charter.

The Academy and the National Research Council have long been concerned with the appropriate use of animals in the pursuit of science. Excellence in biological and medical research and teaching clearly depends upon the study of healthy, properly housed, and otherwise suitable laboratory animals. Accordingly, the Institute of Laboratory Animal Resources—abbreviated by its acronym ILAR—

was founded in 1952 under the auspices of the National Research Council.

ILAR serves as a national and international resource for compiling and disseminating information on laboratory animals. It develops guidelines for the humane care and appropriate use of these animals, surveys existing and required facilities and resources, develops guidelines for upgrading laboratory animal resources, and promotes high-quality, professional care of laboratory animals in the United States.

Since its inception nearly 30 years ago, ILAR has been recognized by various governmental agencies, private biomedical research organizations, industries, universities, medical schools, and other educational institutions as a key advisory group in the laboratory animal field.

A framework for governmental and institutional animal welfare policies is provided through reports prepared by ILAR committees.

ILAR is guided by a 10-member council, currently chaired by myself and composed of specialists in laboratory animal medicine, zoology, genetics, medicine, and related biomedical sciences.

Many ILAR committees are appointed to prepare documents containing guidelines for the care and use of various laboratory animals. One of the most important of these documents is the Guide for the Care and Use of Laboratory Animals, often referred to simply as the "guide."

Its guidelines are based on established scientific principles, expert opinion, and experience with methods and practices that have proved to be consistent with humane, high-quality animal care.

It is a long-standing policy of the U.S. Public Health Service to require adherence to these guidelines by grantees and contractees, and this was spoken to earlier by the NIH representatives.

This guide was first published in 1963 and has been revised in 1965, 1967, 1972, and 1978. Over 250,000 copies have been distributed during the last 18 years.

In addition, a series of more species-specific publications have been developed.

Six years ago, Mr. Chairman, in October 1975, almost exactly 6 years ago this week, ILAR held a symposium entitled, "The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing." This was the first formal examination of what some refer to as "alternatives to animal use" in the United States.

Through the presentations and the published proceedings ILAR examined the contributions and limitations of laboratory animals to the study of human health and welfare, as well as the uses and limitations of cell, tissue, and organ cultures. The uses of other in vitro methods, such as microbiological assays and the applications of mathematical and computer technologies, as substitutes for or complements to laboratory animals in biomedical research and testing were also discussed.

Specialists from the United States and abroad, along with representatives of animal welfare organizations participated in planning the symposium and presenting their views.

Each year the ILAR staff provides hundreds of copies of ILAR documents to the biomedical community and the general public in the United States and abroad and to Members of the Congress.

During 1980, 9,472 ILAR publications were distributed by ILAR or sold by the National Academy Press.

We offer now the following brief comments on points of interest to your committee today.

USE OF ANIMALS IN CURRENT PRACTICE

The ILAR report entitled "National Survey of Laboratory Animal Facilities and Resources, Fiscal Year 1978," indicates that there was a 40-percent decrease in the use of laboratory mammals and birds in research between fiscal year 1968 and fiscal year 1978. This marked decrease appears to be due to economic factors such as costs of space, equipment, and animal care, and to scientific factors such as new or faster techniques which use fewer or no animals. We know of no reasons why this trend will not continue.

ALTERNATIVES TO ANIMAL USE AND HUMANE AND APPROPRIATE ANIMAL USE

It is fair to state that no single document has been more widely used in the provision of humane animal care than ILAR's guide, the next revision of which will be its fifth.

Revisions consistently incorporate improvements in animal-care knowledge. It is interesting to note that the first edition of this guide in 1963 preceded the Animal Welfare Act by 3 years. The species-specific documents containing guidelines for care and management have served a similar purpose.

As I mentioned, almost exactly 6 years ago ILAR convened the symposium on what some now refer to as alternative methods, and this was the first U.S. effort to formally address these issues which have only recently become of such interest to nonscientists.

The scientific community has continued to address the subject. ILAR, through its committees, remains attentive to the research potential of a wide variety of life forms, including invertebrates and nonmammalian vertebrates.

A number of ILAR books are concerned with these so-called lower animals.

INCENTIVES FOR ALTERNATIVES

The apparent 40-percent decrease in animal use noted earlier and the concurrent increase in the use of tissue culture, organ culture, and biotechnology seem to indicate that, where scientifically valid, nonanimal techniques are widely used.

Economic considerations related to the costs of animals and their care, maintenance of animal space and equipment, and appropriate staff appear to be powerful and effective incentives for the conservative use of laboratory animals and the substitution of less costly approaches when scientifically valid.

Nearly always, nonanimal techniques are less expensive than those which employ animals. We hasten to add, however, that most fields of medicine and science must rely in greater or lesser part on the study of a variety of animals in research into heart disease, cancer, genetic disorders, immunologic diseases, human reproduction, and metabolic disorders, to name a few. Particularly, advances in surgery, anesthesiology, environmental safety, and nutrition emanate from studies of animals.

While science must be responsive to public concerns, the Congress has traditionally established program directions rather than specific methodologies.

We urge you, with respect, to differentiate between legislative proposals aimed at the humane and appropriate care of laboratory animals and those which would mandate a specific approach to the conduct of science in America. The National Academy of Sciences wishes to assure members of the subcommittee that in those fields of science where animals continue to be necessary it is committed to the enlightened selection and humane care of these animals.

Continued progress in life sciences such as medicine, biology, agriculture, and veterinary medicine depends on a mixture of approaches and methods that the scientific community continuously evaluates, discarding some and accepting others, using the criterion of scientific excellence as its benchmark.

Mr. Chairman, I thank you for this opportunity to give this presentation. I will be happy to respond to any questions you may have.

[The prepared statement of Dr. Loew follows:]

NATIONAL ACADEMY OF SCIENCES

NATIONAL RESEARCH COUNCIL

INSTITUTE OF LABORATORY ANIMAL RESOURCES

WASHINGTON, DC

Mr. Chairman, Members of the Subcommittee, I am Franklin M. Loew, testifying today on behalf of National Academy of Sciences/National Research Council (NRC) in my role as Chairman of the NRC's Institute of Laboratory Animal Resources. I am also Director of the Division of Comparative Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland. I received a Doctor of Veterinary Medicine (D.V.M.) degree from Cornell University in 1961 and a Ph.D. degree from the University of Saskatchewan in 1971.

I am a Diplomate of the American College of Laboratory Animal Medicine, a Fellow of the American College of Veterinary Toxicology, and a member of numerous scientific societies, including the American and Canadian Associations for Laboratory Animal Science, The American and Canadian Veterinary Medical Associations, the American Institute of Nutrition, the Nutrition Society of Canada, and the Society of Toxicology. I am presently a member of the Board of Trustees of the Baltimore Zoological Society and on the Board of Directors for the Association for Biomedical Research.

In addition to directing the Johns Hopkins University's academic program in comparative medicine, I am also chief of its laboratory animal medicine unit, with responsibility for overseeing the care and use of animals used in research programs.

BACKGROUND

The National Academy of Sciences (NAS) is a private, non-profit organization created by a Congressional charter signed by President Abraham Lincoln in 1863. The charter calls upon the Academy to serve as an official advisor to the federal government on questions of science and technology. Further objectives of the NAS are to stimulate research and its application, survey the broad potentialities of science and technology, promote effective utilization of the scientific and technical resources of the country, and advance the general interests of science.

The National Research Council (NRC) was established in 1916 and is the principal instrument through which the NAS discharges the fundamental responsibility embodied in its charter. While a large proportion of the activities of the NRC are undertaken in response to requests from federal agencies, which provide the necessary funds, many of its studies originate from and are supported by non-governmental sources. Nearly all substantive tasks of the components of the NRC are carried out by committees of recognized experts and scientists from academic institutions, industry, and other segments of the scientific community, working with the NRC staff. Those who serve on these committees constitute the NRC in action. Appointments are made by the NRC after an elaborate process of search, selection, nomination, and approval, in an effort to assemble committees of the highest competence, carefully tailored to their tasks. Committee reports go through an extensive review procedure before they are released as reports of the National Research Council.

The Academy and NRC have long been concerned with the appropriate use of animals in the pursuit of science; excellence in biological and medical research and teaching clearly depends upon the study of healthy, properly housed, and otherwise suitable laboratory animals. Accordingly, the Institute of Laboratory Animal Resources (ILAR) was founded in 1952 under the auspices of the NRC. ILAR serves as a national and international resource for compiling and disseminating information on laboratory animals. It develops guidelines for the humane care and appropriate use of these animals, surveys existing and required facilities and resources, develops guidelines for upgrading laboratory animal resources, and promotes high-quality, professional care of laboratory animals in the United States. Since its inception nearly 30 years ago, ILAR has been recognized by various governmental agencies, private biomedical research organizations, industries, ~~and~~ universities, medical schools and other educational institutions as a key advisory group in the laboratory animal field. A framework for governmental and institutional animal welfare policies is provided through reports prepared by ILAR committees.

ILAR cooperates with many professional groups in carrying out its work. Three national organizations with which ILAR maintains a strong relationship are the:

- American College of Laboratory Animal Medicine (ACLAM), a specialty board of the American Veterinary Medical Association (AVMA) that certifies veterinarians who meet criteria of training and experience in laboratory animal medicine;

- American Association for Laboratory Animal Science (AALAS), formerly the Animal Care Panel, an association of individuals, institutions, and local affiliates involved in laboratory animal science. Its activities include training animal technicians, conducting meetings, and publishing the journal Laboratory Animal Science; and
- American Association for Accreditation of Laboratory Animal Care (AAALAC), an organization that certifies the quality of laboratory animal facilities by accrediting those that meet its high standards for animal care.

Many ILAR committee members are also members of these groups, and ILAR's scientific publications, guidelines, and advice are used by these organizations in carrying out their functions. At the international level, ILAR is recognized by the International Council for Laboratory Animal Science (ICLAS) as the national body in the United States that is concerned with the direction and encouragement of scientific research within ICLAS' field of interest.

ILAR is guided by a ten-member Council, currently chaired by Dr. Franklin M. Loew, Division of Comparative Medicine, Johns Hopkins University, and composed of specialists in laboratory animal medicine, zoology, genetics, medicine, and related biomedical sciences. There is one standing committee, the Committee on Animal Models and Genetic Stocks, and other committees are appointed from time to time to conduct special studies and prepare reports.

AIMS AND OBJECTIVES OF ILAR

The specific aims and objectives of ILAR are to:

- provide scientific advice to agencies of the Federal government and other groups, upon request, on matters concerning laboratory animals;
- develop, publish and promote guidelines for humane and ethical care, breeding, and use of laboratory animals;
- promote conservative and judicious use of laboratory animals; and
- provide information to the biomedical community and general public on:

  a. appropriate animal models for study of biological and pathological phenomena;

  b. breeding techniques, husbandry, disease prevention, and general care and treatment of animals;

  c. location and availability of laboratory and free-ranging animals; and

  d. preparation for professional and nonprofessional careers in the care of laboratory animals.

METHODS FOR MEETING AIMS AND OBJECTIVES

Scientific Advice

ILAR provides scientific advice to agencies of the federal government and to other groups through published or unpublished reports of its committees. Many such reports are separately funded as special projects by requesting organizations or agencies. Committees having recently completed such reports are:

- Committee on Animal Models for Research on Aging. In response to a request from the National Institute on Aging (NIA), the members of this committee analyzed uses of selected mammalian models in the study of aging, evaluated the relevance and appropriateness of these models, developed criteria for selection of models, and prepared recommendations to the NIA. The Committee's report, Mammalian Models for Research on Aging, was published in January, 1981.

- Committee on Laboratory Animal Facilities and Resources. This committee was established in response to a request from the National Institutes of Health (NIH) to conduct a national survey of laboratory animal facilities and resources supporting biomedical research during FY 1978. Published in 1980, the National Survey of Laboratory Animal Facilities and Resources updates surveys conducted in FY 1962 and FY 1968 and provides the NIH with objective data on the current status of animals used in biomedical research, animal resource personnel, facilities, and programs throughout the United States. The results of the FY 1978 survey assist NIH in planning and establishing training programs for improving the quality of laboratory animals, promoting better institutional care for and humane treatment of laboratory animals, and establishing training programs in laboratory animal medicine.

Animal Care

Many ILAR committees are appointed to prepare documents containing guidelines for the care and use of various laboratory animals. One of the most important of these documents is the Guide for the Care and Use of Laboratory Animals, referred to as the "Guide." Its guidelines are based on established scientific principles, expert opinion, and experience with methods and practices that have proved to be consistent with humane, high-quality animal care. It is a long-standing policy of the U. S. Public Health Service to require adherence to these guidelines by grantees and contractees. In addition, the American Association for Accreditation of Laboratory Animal Care uses the tenets of the "Guide" in accrediting animal facilities. The "Guide" was first published in 1963 and revised in 1965, 1967, 1972, and 1978. Over 250,000 copies have been distributed during the last 18 years. In addition, a series of more species-specific publications have been developed.

Examples of two ILAR committees that recently prepared animal care documents are:

- Committee on Nonhuman Primates, Subcommittee on Care and Use. This committee updated a 1973 publication on the breeding and care of nonhuman primates. The new document, entitled Laboratory Animal Management: Nonhuman Primates, was published in 1980.
- Committee on Marine Invertebrates. This committee gave special attention to the methods for managing marine invertebrates in the laboratory. The report was published in June, 1981.

A new committee has just been appointed to update the 1971 publication, A Guide to Infectious Diseases of Mice and Rats. The revision is expected to be published in 1983.

Animal Conservation

Six years ago, in October 1975, ILAR held a symposium entitled "The Future of Animals, Cells, Models, and Systems in Research, Development, Education and Testing." This was the first formal examination of what some refer to as "alternatives to animal use" in the United States. Through the presentations and the published proceedings, ILAR examined the contributions and limitations of laboratory animals to the study of human health and welfare, as well as the uses and limitations of cell, tissue, and organ cultures. The uses of other *in vitro* methods, such as microbiological assays and the applications of mathematical and computer technologies, as substitutes for or complements to laboratory animals in biomedical research and testing were also discussed. Specialists from the United States and abroad, along with representatives of animal welfare organizations participated in planning the symposium and presenting their views.

As a part of its work in promoting conservation, ILAR's Committee on Nonhuman Primates responded to a request of the NIH by establishing the Subcommittee on Conservation of Natural Populations to prepare a field manual to assist students, researchers, and conservation personnel in conducting censuses of wild populations of nonhuman primates. The document, entitled *Techniques for the Study of Primate Population Ecology*, will be published in late 1981.

Information Services

ILAR provides a forum for the discussion of important laboratory animal problems through sponsorship and cosponsorship of conferences, workshops, and symposia, the proceedings of which are published.

Each year the ILAR staff provides hundreds of copies of ILAR documents to the biomedical community and the general public in the United States and abroad and to members of the Congress. During 1980, 9,472 ILAR publications were distributed by ILAR or sold by the National Academy Press. ILAR's quarterly journal, the ILAR News, has a worldwide circulation of approximately 4,000 copies. Typically an issue contains information on future and recent local, national, and international meetings of interest to its readers; general announcements; ILAR and NAS/NRC news; announcements of recently published books; proposed and established Federal regulations or bills in the U. S. Congress concerning laboratory animals; lists of reference material available; and other information of interest to a variety of persons and organizations involved with laboratory animals. Frequently there are special articles by invited authors.

Publications

A list of ILAR publications currently available is attached. It is a further indication of the scope of ILAR's work over the years.

SPECIFIC RESPONSE TO SUBCOMMITTEE CONCERNS

The last Congressional hearings on the general subject of animals in research were held in the Eighty-ninth Congress in 1965 and 1966. During the hearings (Regulate the Transportation, Sale, and Handling of Dogs and Cats Used for Research and Experimentation) of March 7 and 8, 1966, Dr. Sigmund Rich described ILAR's activities to the Subcommittee on Livestock and Feed Grains of the Committee on Agriculture. We offer now the following comments on points of interest to your Subcommittee:

1. Use of animals in current practice.

The ILAR report referred to earlier (National Survey of Laboratory Animal Facilities and Resources. FY 1978, page 21) indicates there was a 40% decrease in the use of laboratory mammals and birds in research between FY 1968 and FY 1978. This marked decrease appears to be due to economic factors such as costs of space, equipment, and animal care, and to scientific factors such as new or faster techniques which use fewer or no animals. We know of no reason why this trend will not continue.

2. Alternatives to animal use and humane and appropriate animal use.

It is fair to state that no single document has been more widely used in the provision of humane animal care than ILAR's "Guide," the next revision of which will be its fifth. Revisions consistently incorporate improvements in animal-care knowledge. It is interesting to note that the first edition of the "Guide," in 1963, preceded the Animal Welfare Act by three years. The species-specific documents containing guidelines for care and management have served a similar purpose.

Six years ago, ILAR convened a symposium entitled "The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing." The proceedings were published in 1977. As previously noted, this was the first U. S. effort to address these issues, which have only recently become of such interest to nonscientists. The scientific community has continued to address the subject. ILAR, through its committees, remains attentive to the research potential of a wide variety of life forms, including invertebrates and nonmammalian vertebrates.

A number of ILAR books are concerned with these "lower" animals:

- Animal Models for Biomedical Research V -- Invertebrates (1973);
- Guidelines for the Breeding, Care, and Management of Laboratory Animals: Amphibians (1974);
- Molluscan Pathology (1976);
- Laboratory Animal Management: Wild Birds (1977);
- Animals as Models of Environmental Pollutants (1979); and
- Laboratory Animal Management: Marine Invertebrates (1981).

3. Incentives for alternatives.

The apparent 40% decrease in animal use noted above, and the concurrent increase in the use of tissue culture, organ culture, and "biotechnology" seem to indicate that, where scientifically valid, non-animal techniques are widely used. Economic considerations related to the costs of animals and their care, maintenance of animal space and equipment, and appropriate staff appear to be powerful and effective incentives for the conservative use of laboratory animals and the substitution of less costly approaches when scientifically valid. Nearly always, non-animal techniques are less expensive than those which employ animals. We hasten to add, however, that most fields of medicine and biology must rely in greater or lesser part on the study of a variety of animals in research into heart disease, cancer, genetic disorders, immunologic diseases, human reproduction, and metabolic disorders, to name a few. Particularly, advances in surgery, anesthesiology, environmental safety, and nutrition emanate from studies of animals.

4. Pending legislation.

While science must be responsive to public concerns, the Congress has traditionally established program directions rather than specific methodologies. We urge you to differentiate between legislative proposals aimed at the humane and appropriate care of laboratory animals and those which would mandate a specific approach to the conduct of science in America.

The National Academy of Sciences wishes to assure members of the Subcommittee that in those fields of science where animals continue to be necessary, it is committed to the enlightened selection and humane care of these animals. Continued progress in life sciences such as medicine, biology, and veterinary medicine depends on a mixture of approaches and methods that the scientific community continuously evaluates, discarding some and accepting others, using the criterion of scientific excellence as its benchmark.

ILAR STAFF AND COMMITTEES

Officers, professional staff, and members of the current ILAR Council and Committees are shown below. Other committees are formed as new tasks are undertaken and funding support is received.

Officers and Professional Staff

Franklin M. Loew, Division of Comparative Medicine, The Johns Hopkins University School of Medicine, Baltimore, MD; Chairman of ILAR Council
Earl W. Grogan, Executive Secretary
Dorothy D. Greenhouse, Staff Officer
Andrea L. Cohen, Staff Assistant

Council

Franklin M. Loew, Division of Comparative Medicine, The Johns Hopkins University School of Medicine, Baltimore, MD; Chairman
Emerson L. Besch, College of Veterinary Medicine, University of Florida Gainesville
Philip B. Carter, University of Illinois, College of Veterinary Medicine, Urbana
Robert P. Hanson, Department of Veterinary Science, University of Wisconsin, Madison
Leah M. Lowenstein, School of Medicine, Boston University, Boston, MA
Richard J. Montali, Office of Pathology, National Zoological Park, Smithsonian Institution, Washington, DC
W. Ann Reynolds, Provost, The Ohio State University, Columbus
Clifford R. Roberts, Department of Animal Resources, Division of Veterinary Medicine, Walter Reed Army Institute of Research, Washington, DC
Adrianne E. Rogers, Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge
William T. Watson, Veterinary Resources Branch, National Institutes of Health, Bethesda, MD

Committee on Animal Models and Genetic Stocks

William H. Stone, Laboratory of Genetics, University of Wisconsin, Madison; Chairman
Gustavo D. Aguirre, Department of Opthalmology, Small Animal Hospital, University of Pennsylvania, Philadelphia
Norman H. Altman, Papanicolaou Cancer Research Institute, Miami, FL
Irwin S. Bernstein, Department of Psychology, University of Georgia, Athens
Linda K. Collins Cork, Division of Comparative Medicine and Department of Pathology, The Johns Hopkins University School of Medicine, Baltimore, MD
Thomas J. Gill, III, Department of Pathology, University of Pittsburgh School of Medicine, Pittsburgh, PA
Clement L. Markert, Biology Department, Yale University, New Haven, CT
Susumu Ohno, Department of Biology, City of Hope Medical Center, Duarte, CA

Subcommittee on Conservation of Natural Populations (Committee on Nonhuman Primates)

John F. Eisenberg, National Zoological Park, Smithsonian Institution, Washington, DC; Chairman
Wolfgang P. J. Dittus, Smithsonian Research Fellow, Kandy, Sri Lanka
Theodore H. Fleming, Department of Biology, University of Miami, Coral Gables, FL
Kenneth Green, Department of Zoology, Howard University, Washington, DC
Thomas T. Struhsaker, New York Zoological Society, Fort Portal, Uganda
Richard W. Thorington, Jr., Division of Mammals, Smithsonian Institution, Washington, DC

Committee on Infectious Diseases of Mice and Rats

J. Russell Lindsey, Department of Comparative Medicine, Schools of Medicine & Dentistry, University of Alabama in Birmingham, Birmingham, AL; Chairman
Gary Boorman, Environmental Biology Branch, Comparative Pathology Section, National Institute of Environmental Health Sciences, Research Triangle Park, NC
C. K. Hsu, Comparative Medicine Program, School of Medicine, University of Maryland, Baltimore
Roger Orcutt, The Charles River Breeding Laboratories, Wilmington, MA
Joseph E. Wagner, College of Veterinary Medicine, University of Missouri, Columbia

Mr. Chairman, I thank you for the opportunity to give this presentation and written statement. I will be happy to respond to any questions.

ILAR PUBLICATIONS AVAILABLE

Animal Care Documents

Guide for the Care and Use of Laboratory Animals. ILAR Committee on Care and Use of Laboratory Animals. Revised 1978

Standards for the Breeding, Care, and Management of Laboratory Animals: Syrian Hamsters. ILAR Committee on Standards. 1960

Standards for the Breeding, Care, and Management of Laboratory Animals: Guinea Pigs. ILAR Committee on Standards. 1964

Standards for the Breeding, Care, and Management of Laboratory Animals: Laboratory Rabbits. ILAR Committee on Standards. 1965

Standards and Guidelines for the Breeding, Care, and Management of Laboratory Animals: Chickens. ILAR Committee on Standards. 1966

A Guide to Infectious Diseases of Guinea Pigs, Gerbils, Hamsters, and Rabbits. ILAR Committee on Laboratory Animal Diseases. 1974

Guidelines for the Breeding, Care, and Management of Laboratory Animals: Amphibians. ILAR Subcommittee on Amphibian Standards, Committee on Standards. 1974

Guidelines for the Breeding, Care, and Management of Laboratory Animals: Ruminants. Cattle, Sheep, and Goats. ILAR Subcommittee on Standards for Large (Domestic) Laboratory Animals, Committee on Standards. 1974

Guide for the Care and Use of the Nude (Thymus-Deficient) Mouse in Biomedical Research. ILAR Committee on Care and Use of the "Nude" Mouse. 1976

Spontaneously Hypertensive (SHR) Rats: Guidelines for Breeding, Care, and Use. ILAR Committee on Care and Use of Spontaneously Hypertensive Rats. 1976

Long-Term Holding of Laboratory Rodents. ILAR Committee on Long-Term Holding of Laboratory Rodents. 1976

Social and Behavioral Correlates of Successful Breeding in Nonhuman Primate Colonies. Proceedings of a seminar sponsored by ILAR. 1977

Laboratory Animal Management: Rodents. ILAR Committee on Rodents. 1977

Laboratory Animal Management: Wild Birds. ILAR Committee on Birds. 1977

Animal Care Documents (Continued)

Laboratory Animal Housing. Proceedings of a symposium sponsored by ILAR. 1978

Laboratory Animal Management--Cats. ILAR Committee on Cats. 1978

Laboratory Animal Management: Genetics. 1979

Laboratory Animal Management: Nonhuman Primates. ILAR Subcommittee on Care and Use, Committee on Nonhuman Primates. 1980

Laboratory Animal Management: Marine Invertebrates. ILAR Committee on Marine Invertebrates. 1981

Animal Model Documents

Animal Models for Biomedical Research. III. Proceedings of a symposium cosponsored by ILAR and the American College of Laboratory Animal Medicine. 1970

Animal Models for Biomedical Research. IV. Proceedings of a symposium cosponsored by ILAR and the American College of Laboratory Animal Medicine. 1971

Selected Abstracts on Animal Models for Biomedical Research. ILAR Committee on Animal Models and Genetic Stocks. 1971

Selected Abstracts on Animal Models for Biomedical Research--III. ILAR Committee on Animal Models and Genetic Stocks. 1974

Selected Abstracts on Animal Models for Biomedical Research--IV. ILAR Committee on Animal Models and Genetic Stocks. 1976

Animal Models for Biomedical Research V -- Invertebrates. Proceedings of a symposium cosponsored by the American Society for Experimental Pathology, ILAR, and the American Physiological Society. 1973

Molluscan Pathology. Proceedings of a workshop cosponsored by ILAR and the Registry of Comparative Pathology. 1976

Animal Models of Thrombosis and Hemorrhagic Diseases. Proceedings of a workshop cosponsored by the National Heart and Lung Institute and ILAR. 1976

Animal Models for Research on Contraception and Fertility. Proceedings of symposium sponsored by ILAR. 1979

Mammalian Models for Research on Aging. ILAR Committee on Animal Models for Research on Aging. 1981

Animal Model Documents (Continued)

Second International Registry of Animal Models of Thrombosis and Hemorrhagic Diseases. W. J. Dodds. 1981

Procurement Specifications

Procurement Specification I. Nonconditioned Random-Source Dogs. ILAR Subcommittee on Laboratory Animal Procurement Standards. 1966

Procurement Specification II. Nonconditioned Random-Source Cats. ILAR Subcommittee on Laboratory Animal Procurement Standards. 1966

Procurement Specification III. Conditioned Random-Source Dogs. ILAR Subcommittee on Dog and Cat Procurement Standards. 1968

Procurement Specification IV. Conditioned Random-Source Cats. ILAR Subcommittee on Dog and Cat Procurement Standards. 1968

Procurement Specification V. Kennel-Produced Dogs. ILAR Subcommittee on Dog and Cat Procurement Standards. 1969

Procurement Specification VI. Colony-Produced Cats. ILAR Subcommittee on Dog and Cat Procurement Standards. 1969

Procurement Specification VII. Rodents. ILAR Sucommittee on Rodent and Rabbit Procurement Standards. 1969

Procurement Specification VIII. Rabbits. ILAR Subcommittee on Rodent and Rabbit Procurement Standards. 1969

Procurement Specification IX. Defined Laboratory Rodents and Rabbits. ILAR Subcommittee on Defined Rodents and Rabbits Standards. 1973

Procurement Specification X. Defined Wild Caught Old World Monkeys. ILAR Subcommittee on Procurement Standards for Nonhuman Primates. 1973

Other ILAR Publications

Nonhuman Primates. Usage and Availability for Biomedical Programs. ILAR Committee on Conservation of Nonhuman Primates. 1975

Research in Zoos and Aquariums. Proceedings of a symposium sponsored by ILAR. 1975

Neotropical Primates: Field Studies and Conservation. ILAR Committee on Conservation of Nonhuman Primates. 1976

Other ILAR Publications (Continued)

Primate Population Surveys in Guyana and Bolivia. ILAR Committee on Conservation of Nonhuman Primates. 1976

Environmental and Genetic Factors Affecting Laboratory Animals: Impact on Biomedical Research. Proceedings of a symposium sponsored by the American Society for Pharmacology and Experimental Therapeutics, American College of Laboratory Animal Medicine, and ILAR. 1976

Congenital Defects of Wild and Zoo Mammals. G. Saperstein, H. W. Leipold, S. M. Kruckenberg, and N. A. Muckenhirn. 1977

The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing. Proceedings of a symposium sponsored by ILAR. 1977

Control of Diets in Laboratory Animal Experimentation. ILAR Committee on Laboratory Animal Diets. 1978

Animals for Research--A Directory of Sources. 10th ed. Compiled and edited by D. D. Greenhouse and A. L. Cohen. 1979

Supplement to Animals for Research. A Directory of Sources. 10th ed. Compiled and edited by D. D. Greenhouse and A. L. Cohen. 1981

Animals as Monitors of Environmental Pollutants. Proceedings of a symposium cosponsored by Northeastern Research Center for Wildlife Diseases, Registry of Comparative Pathology, and ILAR. 1979

Laboratory Animal Medicine: Guidelines for Education and Training. ILAR Committee on Education. 1979

Laboratory Animal Records. ILAR Committee on Laboratory Animal Records. 1979

Histologic Typing of Liver Tumors of the Rat. ILAR Subcommittee on Rat Liver Tumors, Committee on Histologic Classification of Laboratory Animal Tumors. 1980

National Survey of Laboratory Animal Facilities and Resources. FY 1978. ILAR Committee on Laboratory Facilities and Resources. 1980

Mr. **Walgren**. Thank you.

You do not feel that humane care for animals is inconsistent with scientific progress?

Dr. **Loew**. Not at all. On the contrary, it is our belief that the two go hand in hand.

Mr. **Walgren**. And I would gather then that we mean by humane care, is care that certainly would not violate the public's sensitivities were they to know and view what is going on in these kinds of laboratories?

Dr. **Loew**. Certainly the public sensitivity to animal research is clear, continuing, and in my view, growing. I am not sure, though, that I understand your question.

If you are saying that humane care would always result in a laboratory situation pleasing to all members of the public, I am not sure that would be true because, clearly, an operation performed under anesthesia in either a human or an animal is not something that everyone would choose to view. But if you mean the avoidance of situations which were described earlier, for example—although I have no first-hand knowledge of that particular case, it didn't seem to meet the requirements of our guide—of course, we are for the kind of treatment that would obviate those kinds of results, based on what I have heard today.

Mr. **Walgren**. In the academy's role as adviser to the Federal Government's scientific establishment, are there suggestions that you can make that would improve the peer review process, in particular as to how it is focused on the appropriate or inappropriate use of animals?

Dr. **Loew**. I am not at liberty to speak on behalf of the academy in terms of such suggestions, but I can certainly state that ILAR carries out studies of this kind at the request of branches of Government where it would address those kinds of specific questions and provide its opinion to——

Mr. **Walgren**. Carry out the peer review process.

Dr. **Loew** [continuing]. Carry out a study of—for example, the peer review process as it applies to animal care and use.

Mr. **Walgren**. Have they ever looked at the degree to which consideration is given to the aspect of the suffering involved in an experiment? When you say that they have studied the peer review process, have they made any recommendations about how it might be strengthened in terms of taking into consideration or making sure that proper weight is given to that factor?

Dr. **Loew**. Mr. Chairman, I either misspoke or you misunderstood my remarks. ILAR has not carried out such a study, but it could in its function as adviser to the Government, if it were requested to do so. I can tell you that ILAR would certainly, I think, be interested in carrying out such a study. I am sorry if I misled you.

No such examination has yet been done by ILAR.

Mr. **Walgren**. How involved is such a study? Can you do it for nothing?

Dr. **Loew**. No. It would cost money and time, and ILAR, the National Research Council, carries out all of its studies for fees. The moneys are expended by the agencies or groups that request the studies to be carried out.

But it is certainly the kind of thing that ILAR has been doing for many years, and speaking as the council chairman—I am only one person, but speaking as its chairman, I would think that that would be an interesting assignment.

Mr. WALGREN. Not being in the position to give you that assignment, what is your personal reaction to the peer review approvals? From your background in this area, are there any personal suggestions you could make that would improve the examination and the consideration of pain and suffering in the peer review process?

Dr. LOEW. Mr. Chairman, first speaking as the ILAR Chairman, we believe that the documents that we have prepared and revised over the years provide a fine framework for the peer review system to operate in a way that you and I would hope it would.

Now speaking personally, it would be my view, as previous speakers have said today, that perhaps some improvements are required in the way the scientific proposals are evaluated with respect to the specific uses of animals. I don't know that my personal views are of any greater value than anyone else's, although I would certainly agree that the system could use some tightening.

Mr. WALGREN. Well, certainly. Why don't I invite you to submit some informal personal views of your own or others on ILAR which would give us an indication of what might be constructive in this area?

Dr. LOEW. I would be happy to do that, Mr. Chairman.

Mr. WALGREN. I know we all like to operate as institutions, but it is too cumbersome, and at this point I think we are looking for ideas that we can raise in discussion with NIH and others that would be helpful. So I would certainly appreciate any thoughts that you, and ask you to pass the invitation around to the other members of your Council.

Let me ask whether you have any thoughts on how the animal care committees that the NIH now use might function better?

Dr. LOEW. Again speaking personally, Mr. Chairman, as the chairman, for example, of the Johns Hopkins School of Medicine's animal care committee and having been the chairman of animal care committees elsewhere, I feel that the concept of having a local animal care committee at each institution using animals should be a mandatory thing.

Second, I think that these committees should become more involved in the evaluation of the research projects in the specific than they have tended to be.

My experience has been that the animal care committees do deal with specific research proposals but only occasionally; they are more concerned with the institutional setting for research to take place, and I would think, again speaking personally now and not representing the academy views, that it would be desirable to develop a way in which these local committees can have clearer responsibilities for the specific animal experiments going on in their institutions.

Mr. WALGREN. I would be very interested in what recommendations you might be able to make along that line in view of your background with that particular animal care committee.

Am I hearing correctly when you say that many times animal care committees simply look at the institutional arrangements but not the treatment of the animal in the process of the experiment? Is there a distinction made there?

Dr. **Loew**. There is a distinction there. I think the committees do tend to deal more with the former than with the latter although they do deal with the latter.

Usually an individual scientist or the veterinarian or the person responsible for providing adequate veterinary care in the institution will bring specific cases to the committee that he or she has had difficulties dealing with, or seeks guidance on, or wishes the committee to review.

I don't think that it's the routine practice for animal care committees in this country to assemble as a committee to review every proposal for every research project going on in the institution, although that may occur at some institutions.

My personal experience again would suggest that that is not the case, but rather that an officer of the committee or the veterinarian responsible for animal care in that institution reviews these, screens them, and brings ones that are exceptional in some way to the attention of the committee.

Mr. **Walgren**. Do you think it would be helpful to have a system where each member of the animal care committee would make a positive representation that from his or her point of view the experiment that is occurring at that particular facility is acceptable and within constructive bounds?

Dr. **Loew**. A signoff procedure of some kind?

Again, speaking personally, I see no objection to that.

Mr. **Walgren**. Well, I certainly appreciate knowing that you are there at Johns Hopkins and that you have been involved in that area.

I would certainly appreciate your personal views as well as the views of any of your associates.

Dr. **Loew**. Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you very much for coming to the committee.

Mr. **Walgren**. The last witness today is Dr. David Brusick, the director of the Department of Molecular Toxicology, with Litton Bionetics of Kensington, Md.

Dr. Brusick, we are glad you could join us and we would appreciate hearing your views in this area.

Your written statement will be made part of the record, and please proceed as you feel is best.

STATEMENT OF DAVID J. BRUSICK, DIRECTOR, DEPARTMENT OF MOLECULAR TOXICOLOGY, LITTON BIONETICS, INC., KENSINGTON, MD.

Dr. **Brusick**. Thank you, Mr. Chairman.

I have a written statement which I would like to read, and possibly a few points of clarification as I go along.

My name is David Brusick and I am vice president and director of molecular toxicology at Litton Bionetics, Inc., at Kensington, Md.

I think it is safe to say that safety testing and the related research represent one of the largest uses of laboratory research animals. The company which employs me, Litton Bionetics, Inc., is a contract research laboratory which, among other things, conducts safety testing for industrial chemicals, environmental chemicals, and pharmaceuticals.

Our company performs both long-term, large-scale animal studies as well as what I refer to as molecular toxicology studies which use few or no animals.

From the point of our company and our clients there is clearly an interest in and a recognized need for molecular toxicology. This need, as I see it, is based more upon the ability to predict hazards in a short time and the favorable economics associated with safety testing programs employing in vitro testing, that is nonanimal testing, and not to a great extent on moral or ethical issues of using animals as test organisms.

I would like to briefly cite some of the factors which are at work in the field of safety testing which are moving much, but not all of the testing from live animals to nonanimal model systems.

First of all the most important factor involves the application of nonanimal tests in identifying presumptive carcinogens. In vivo lifetime studies in rodents or other animal species are presently the only methods for carcinogen assessment which is recognized in regulatory decisionmaking.

The cost, presently between $600,000 and $1 million per chemical, and the performance time, 2 to 3 years, for a single rodent bioassay are of sufficient magnitude to warrant preliminary testing with in vitro predictive tests in order to assist in the decision to invest corporate resources into these more expensive toxicological assays.

In the in vitro systems, which are highly reliable and can be quite predictive, tests on candidate compounds can be performed within a matter of 3 months for approximately one test—one-tenth the cost of a single rodent cancer study.

As point of comparison I would like to just sidetrack for one moment to give you some of the figures which might be useful. In conducting an assessment for carcinogenic potential the amount of money compared between the two types of approaches would be approximately $25,000 for an assessment using nonanimal model systems versus an average of half a million dollars-plus for an animal model system. Three months versus three years with respect to time.

Nonanimal systems in many cases are not totally devoid of the use of animals. We do use a single animal in a short-term test for various reasons versus approximately 600 animals that would be involved in an animal bioassay. And then the amount of space, which would include the costs and overhead requirements are comparative in the sense of 500 square-foot-months (which means the space occupied by the number of months), first for a short-term test, versus 7,500 square-foot-months for a chronic lifetime study in rodents.

Those are just for comparative purposes in understanding the magnitude of the difference between the two types of approaches.

The second reason is that many industrial chemicals that do not require carcinogenicity testing are nevertheless involved in significant human exposures which would justify having some information which estimates the carcinogenic potential of these materials in order to protect production workers and end-product consumers. Short-term tests are often the only source of this safety information for these agents.

Third, cancer is fundamentally a cellular process which arises from specific alterations in the control mechanisms of individual cells. It is often difficult to establish a mechanism of action for agents which increases the tumor incidence in a rodent species under animal bioassay conditions. Occasionally unexpected sex, species, or strain-specific responses are encountered which might affect, and what they affect are the approval of these agents by various regulatory agencies. These differences which are encountered may be resolved if the tumorigenic mechanism of the material were understood.

One of the advantages of the short-term and in vitro techniques is their intrinsic potential to study the mechanisms of neoplasia at the cellular and molecular levels. In vitro techniques have been used to resolve problems involving differential responses in target strains, species and organs. And additionally, short-term tests can be used to resolve the initiating, the promoting or cocarcinogenic properties of test materials. Something that is not readily obtained from other animal species.

Thus, from this one example of the application of short-term nonanimal tests it should be evident that nonanimal model systems can and will play an increasingly important role in chemical safety testing. Also in the final analysis the forcing factors will likely be based upon scientific and economic issues, and I think that the additional bottom line, so to speak, of this type of testing technique is that although animal models cannot necessarily be eliminated from certain types of research, at least in safety testing which utilizes most of the animals there are mechanisms to reduce the number of animals involved in testing the materials for their safety with respect to human use.

Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you very much.

In view of your experience, how can we encourage the broadening of nonanimal testing and, is it a problem of money at this point? Is this industry or this approach limited by the amount of Government funds that are being directed in that direction?

Dr. **Brusick**. Not necessarily. I believe that the programs which are currently undergoing review in the National Toxicology Program are becoming more oriented in the direction of short-term alternative methods, and I think that encouragement of this is highly advantageous for the continuation of this orientation toward nonanimal models.

I think there is also a misconception that some potentially resistant force exists within industry itself to acceptance of these models, when in fact I think that in most cases the majority of our clients which are industrial chemical producers, pharmaceutical producers, and so on, are not discouraged whatever from the use of these techniques.

In fact, they are inclined toward the use of nonanimal models when the data from these types of tests can be used for evaluation purposes and are recognized by regulatory agencies as having some beneficial application to resolution of the safety of the material.

So this area has grown, there is a tremendous amount of money being put into the research by private companies, and I think general acceptance of private companies of this technology exists and I think that from that standpoint, that going hand in hand with the kind of research that could be done in the national toxicology program it should move along very well.

Mr. **WALGREN**. Has there been a reduction in interest in short-term nonanimal tests? It is my understanding that a number of years ago there was a real optimism about how fast we could go in this area and that apparently the Office of Technology Assessment has said that this interest has waned. Do you feel that we are moving fast enough in this area as a government?

Dr. **BRUSICK**. I would say yes. I think we are. Rather than losing interest I think we are becoming more realistic in our assessment of what nonanimal tests are capable of doing. We are trying to approach it from the standpoint of providing a good scientific base upon which we can move from the animal test to the nonanimal test, in each case making sure that what is gain and loss is not going to make a significant impact on the safety of the material, as they would then go to the end product, the consumer.

And I think that as a result of that we have been maybe moving somewhat slower, but I think the interest is still as strong as ever, if not even more so.

Mr. **WALGREN**. Do you think that it would be helpful to direct government research moneys into this area as some of the legislation proposes to do, through a Center for Alternative Testing Methods? Would set-asides of funds be constructive, from your point of view?

Dr. **BRUSICK**. I think certainly recognition of this area, and giving high priority to funding of research in this area would be an advantage. Whether or not there is a need for an additional institute over and above the programs which are already in existence within EPA, NTP, FDA, and so on I really don't know. It may be satisfactory in most instances.

Mr. **WALGREN**. From your position are you generally aware of what is being done in those various agencies in terms of the magnitude of the effort.

Dr. **BRUSICK**. In general, because we receive funds from these agencies to do research and development for them, as well as contracts with private industry.

Mr. **WALGREN**. Could I ask you to submit for the record a listing of activity in this area within the government that you have become aware of in the process of your business activities, so that we might have a good, general overview of where this activity is taking place?

Dr. **BRUSICK**. Yes, Mr. Chairman.

[The information follows:]

LISTING OF SUPPORT FOR STUDYING ALTERNATIVES TO ANIMAL-BASED STUDIES

EPA-sponsored Gene-Tox program which has been ongoing now for several years. This program consists of a review of the literature for *in vitro* and short-term carcinogencity test methods followed by recommendations for application of these tests to safety testing.

EPA-drafted test standard which include protocol development for short-term and *in vitro* tests. OPTS within EPA has moved aggressively into *in vitro* testing as a source of rapid and reliable data on new chemicals.

The FDA is using short-term results for two specific applications in safety testing. One is medical devices and the other is veterinary drugs for food-producing animals. The FDA was one of the first agencies to sponsor research in the application of short-term *in vitro* tests to aspects of safety testing.

NIOSH is sponsoring research and testing studies in the use of *in vitro* techniques as alternatives to animal studies. The majority of this work is sponsored from the toxicology group in Cincinnati.

The majority of current government support for *in vitro* techniques is from NTP. There are several research contracts and testing contracts from NIEHS in Research Triangle, N.C. These contracts involve new test development as well as the validation of existing techniques against data from animal studies. It is within the framework of NTP that a final decision on the validity of *in vitro* alternatives will be made.

Mr. WALGREN. Well, with that I want to express my and the committee's appreciation for your participation.

Mr. Roe certainly was very supportive of your thrust this morning in describing the potential of this kind of alternative testing, and it is something we want to encourage to happen, obviously.

Thank you very much.

I would like to express my appreciation to all of you. I know that it has been a long morning, but I appreciate the attention that the audience, that all of you gave to the witnesses, and the courtesy that you gave to them.

We will resume tomorrow morning at 8:30.

Thank you very much.

[Whereupon, at 1:10 p.m., the subcommittee was adjourned.]

[Questions for the record asked of Dr. W. Gary Flamm, Associate Director for Regulatory Evaluation, Division of Toxicology, Food and Drug Administration, follow:]

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Food and Drug Administration
Rockville MD 20857

Responses for the Record

1. Q. Articles that have appeared recently in scientific journals have called into question the scientific and moral validity of the LD-50 test and its concomitant sacrifice of hundreds of animals for perhaps meaningless results. How can FDA change its mandates to reflect the growing belief in the scientific community that much of the required testing has such limited practical significance as to be almost unusable?

   A. It appears to us that the feelings of the scientific community reflect concern about the excessive application of testing requirements, rather than a concern for the practical significance of the application of the results of animal toxicity studies to hazard assessment. The principle that toxic effects in animals are applicable to man underlies toxicological testing just as it underlies the knowledge base of experimental biology and medicine. It is essential that FDA continue a flexible, scientifically based approach to the determination of what testing requirements are necessary to assure the safety of the products which we regulate. It is important that we seek the advice and comment of the scientific community on our testing requirements and principles of safety evaluation, and as new procedures and techniques come into being that they are adequately validated so that we can use them for hazard assessment. Toxicity testing strategies must remain flexible, and regulators and scientists must exercise sound judgments in the determination of the extent and need for specific testing.

2. Q. In the summer of 1981, the Congressional Office of Technology Assessment suggested that the Federal Government should focus attention on alternatives to long-term animal testing for carcinogenicity. It is my understanding that Dr. David Rall, Director of the National Toxicology Program, agreed with the OTA that such emphasis was appropriate at this time. I understand that Dr. Rall expressed his own opinion that the marked interest and activity that centered on short-term tests 6 or 7 years ago has dissipated, but that those tests are worthy of special attention now. Do you agree that short-term tests offer a potential replacement for at least some current uses of long-term animal tests?

   A. Yes, although they are not reliable as the sole basis for determining the carcinogenicity potential or quantifying the risk of a substance. These tests can provide useful information regarding the potential of a substance to be toxic and data which may facilitate the assessment of hazard. Results from a number of these short-term tests are already used to determine the need and priority for confirmatory long-term animal tests.

3a. Q. The OTA suggested that either a Federal commission be established to draw up criteria and make recommendation or that NTP be directed to develop alternative tests. As you know, there is a legislative proposal to establish a National Center for Alternative Research, [H.R. 556] which, among other things, is to encourage the use of alternatives to animal tests and to encourage development of new tests. Do you find greater merit in one of the three proposals?

A. We would favor the continued support for the National Toxicology Program. This effort is already moving towards developing and validating short-term in vivo and in vitro methods that will, in the future, substitute for long-term testing of chemicals. It seems unnecessary to resort to very expensive and time-consuming initiatives such as a Federal Commission on Alternative Animal Testing Criteria or a National Center for Alternative Research when the National Toxicology Program is an established interagency endeavor which is well on its way to addressing these problems.

3b. Q. Do you have any other suggestions to establish a process to encourage development and adoption of alternatives?

A. As you have accurately stated, alternative testing has two important aspects: development of methodology and adoption and use of the methods developed. The first aspect is the realm of the basic scientist and research. Today's esoteric research procedure may be tomorrow's test. Any proposal needs to recognize that the basic research scientist is often unaware of the possible applicability of his techniques to applied testing. Therefore any proposal, when adopted should contain mechanisms for the basic research scientist to develop and propose uses for his methods in applied research.

The second aspect of development of any alternative method is its validity for its intended use and the test method's adoption by investigators in different laboratories, by regulatory agencies and by the regulated industry. Thus any proposal should include mechanisms for funding of research to determine the validity of the studies developed with a strong input from the users of such methods and animal welfare groups.

4a. Q. How might FDA change its requirements for, perhaps, unnecessarily duplicative testing by corporations?

A. This question involves two levels of consideration. As you know, data developed for many FDA regulated products are by law the property of the sponsor of the compound. To effect a change in these requirements would involve amendment to the Federal Food, Drug, and Cosmetic Act. The proprietary nature of safety data is not a problem for food and color additives; in fact, it is standard procedure to apply any data already available, whether published or unpublished, to new requests for use. For food and color additives, we request only those studies deemed necessary to support safety and which are not already available. At a different level, compounds originally considered for one use not regulated by FDA (such as industrial chemical) can find new uses which may be regulated by the Agency. Such a compound could be tested by a sponsor for one agency and these data could ultimately be submitted to FDA to support a new use of this chemical. Recognizing this possibility, FDA has worked closely with other regulatory agencies to develop (where possible) common recommendations for testing procedures to avoid unnecessary duplication of tests.

4b. Q. Could information garnered by these firms be shared, thus eliminating some of the animal experiments?

A. Proprietary data, can be purchased by any firm from the original sponsor of such studies. Non-proprietary data such as for food additives and color additives already are shared by various regulatory agencies.

5. Q. We understand that the charter of the Interagency Regulatory Liaison Group [IRLG] has recently expired and its duties and functions will now be handled through the Office of Science and Technology Policy. Could you discuss how effective the IRLG was and give some specific indication of what progress was made in the standardization of testing methods and results?

A. The IRLG was established for the purpose of improving public health through sharing of information, avoiding duplication of effort and developing consistent regulatory policy. A number of the IRLG activities were effective in carrying out the designed purpose of the group. Specifically in the area of animal testing, the IRLG established the Testing Standards and Guidelines Work Group for the purpose of attempting to resolve differences in testing requirements by preparing guidelines which would satisfy the toxicity testing needs of all the member agencies. The work group reviewed tests already in use or under development which were required by two or more of the regulatory agencies. They solicited comments from the public sector and coordinated its work with the agencies and others who were also in the process of developing guidelines. The IRLG, published in the Federal Register in

November 1980, a notice announcing the availability of the first four guidelines for acute toxicity studies. Just prior to the expiration of the IRLG charter, guidelines for subchronic, reproduction and skin irritation testing were prepared for public comment. Six other testing guidelines were prepared for Agency comment prior to making them available for comment by the private sector. The release of these guidelines for public comment and Agency review was halted following expiration of the charter. Currently, because of each Agency's awareness of the other Agency activities in guideline development, some coordination and discussion of ongoing activities continues and it is likely that a flexible, yet consistent, approach to developing testing guidelines may be maintained. In particular, in development of the recommended guidelines for Acute Eye Irritation Testing, the work group has responded to the numerous public comments from animal welfare groups, by recommending that eye testing not be conducted on substances known to be corrosive or irritants to the skin, by reducing the number of animals used in the test for each substance not intended for use on or near the eye, and by recommending the use of local anesthetics if pain is anticipated or observed.

THE USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING

WEDNESDAY, OCTOBER 14, 1981

House of Representatives,
Committee on Science and Technology,
Subcommittee on Science, Research and Technology,
Washington, D.C.

The subcommittee met, pursuant to notice, in room 2318, Rayburn House Office Building, commencing at 8:50 a.m., Hon. Doug Walgren (chairman of the subcommittee) presiding.

Mr. **Walgren.** Let's come to order.

This morning we will continue our hearings on the Use of Animals in Medical Research and Testing.

Yesterday, we discussed an example of some serious deficiencies in the care and the use of laboratory animals, and we talked with Government officials and others about ways to make improvements in the present system for protection of research animals, as well as ways that we might reduce animal use.

Today, we will hear first from some persons and groups who have had an active, and in many cases, a long interest in animal welfare. They will give us their ideas on ways to improve animal care.

We will also hear from noteworthy members of the research community addressing areas where improvements can be made, as well as their feelings on the need for animal use in research, particularly with respect to human health.

We have a very full schedule this morning, and because of that, I have to ask witnesses to do their very best to limit themselves to 5 minutes. We want to make a record which will both read well and be complete. We hope to accomplish that by concise oral presentations and then the full written statements which will be made part of the record and will serve as reference for what we hope will result in a compelling case being made for improvements in this area.

So, I am going to ask the committee staff to set a timer at 5 minutes, and then again for 1 more minute. When that first bell rings, you will know that you should think of the most important points you want to make for the verbal record and finish by the second bell. In that way, members of all the panels will be able to make their case in a way that will then be useful when we work with the record with other members that may not be here.

With that, I would like to call the first panel, Dr. Michael Fox, of the Humane Society of the United States; Mrs. Christine Stevens, representing the Society for Animal Protective Legislation; Ms.

Nancy Anne Payton, representing the Massachusetts Society for the Prevention of Cruelty to Animals; Dr. Jay Glass, a researcher from Pittsburgh, Pa., my hometown; and Dr. Michael Giannelli, representing the Fund for Animals.

If you would come forward and take your places, we will start in that order if that is all right with the panel.

So, first, Dr. Michael Fox of the Humane Society of the United States.

STATEMENTS OF DR. MICHAEL FOX, HUMAN SOCIETY OF THE UNITED STATES; CHRISTINE STEVENS, SECRETARY, SOCIETY FOR ANIMAL PROTECTIVE LEGISLATION; NANCY ANNE PAYTON, MASSACHUSETTS SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS; DR. JAY D. GLASS, PITTSBURGH, PA.; AND DR. MICHAEL A. GIANNELLI, THE FUND FOR ANIMALS

STATEMENT OF DR. MICHAEL FOX

Dr. Fox. Thank you, Mr. Chairman.

We greatly appreciate the opportunity to speak here.

The basic thesis of my presentation is that deprivation of social and environmental needs of primates and of other laboratory animals housed in small cages, often in social isolation and without sufficient freedom of movement, can be as bad in terms of the animal's welfare and the validity of experimentation as depriving it of adequate nutrition.

Only provisions for the basic physical requirements of laboratory animals are considered in the present Animal Welfare Act. Provision for their behavioral and psychological needs must now be made since there is ample evidence [full testimony follows after oral evidence] to show that deprivation and/or frustration of their social and environmental requirements jeopardizes not only their psychological and physiological well-being, but also the validity and relevance of research conducted upon them.

I would like to show a few slides, now, please. Could we have the lights down?

Before the Animal Welfare Act was passed, animals were kept under rather indifferent conditions.

Since the act was passed, improvements have been made primarily in sanitation but not in overall standards.

Mr. WALGREN. Just one minute. Is there any way to get that second set of lights down so that those slides will show up?

Dr. Fox. [Slide.] This, for example, is questionable when you compare this kind of system with another, where you have a different microenvironment.

The microenvironments will affect the physiology of the animal and can, therefore, act as extraneous experimental variables.

[Slide.] The act to date has not addressed the adequate space requirements and environmental complexity of social organisms such as this rabbit in an extremely small, rather standard cage.

[Slide.] Similarly with these cats and also with dogs [slide].

The question of exercise and social contact for these animals is very critical since deprivation, as I say, will influence a number of experiments being conducted on these animals.

[Slide.] These are primates in standard cages. Consider that they live for many years in this kind of cage, with solid partitions, with no social contact whatsoever.

These cages are clean. They are being provided with food and water, but as I say, the lack of provision for their psychological needs can be as serious to the animals' welfare as depriving them of an essential nutrient.

Some of the problems that can arise include changes not only in the physiology but in behavior, and behavioral changes then influence physiology, which will then affect the experiment.

[Slide.] This animal is self-mutilating. Sometimes they will show increased aggressive behavior, stereotypic behavior, repetitive masturbation, excessive eating, and so on. [Slide.] This is a monkey recovering from another bout of self-mutilation. These animals are under great social stress when they are deprived. [Slide.] This animal is staring at its hind foot and suddenly bends over and attacks it.

[Slide.] In the wild primates will spend as much as a third of the day engaging in social grooming.

[Slide.] Physical contact results in a marked decrease in heart rate. You can see the center trace there. It is pronounced bradycardia. It is a physiological response to social contact and social-contact animals require this kind of contact on a regular, daily basis. When denied, their physiological state is under a state of imbalance which jeopardizes experimentation.

Stereotypic behavior is a very common problem in laboratory-caged dogs and primates.

[Slide.] Here you can see very clearly another effect of social deprivation, namely, depression. Compare the overt behavior of this dog. Apparently its blood coagulation was different from dogs kept in pairs. [Slide.] They are more alert, happy if you will.

Goodness, that is a fast 5 minutes.

I will try to summarize very quickly.

[Slide.] This is an alternative here from Ciba-Geigy in Switzerland—much larger cages with resting boards and so on.

[Slide.] They go into a little trolley and [slide] are taken to a playroom [slide]. There is very little aggression whatsoever; it is a stable social group. These animals can interact freely. This is very useful for a number of experiments, especially in psychopharmacological drugs.

[Slide.] They are trained to go back for food.

[Slide.] This is an alternative to using the restraining chair, where the animal can have an umbilicus, providing injections. So we must think of alternatives.

[Slide.] This again is an alternative to using the crush cage. The animal extends its arm for a reward, a little fruit juice, and then it can be injected. There are gentle ways of dealing and reasonable ways of housing animals.

We must as scientists and humanitarians consider the whole environment.

[Slide.] Conditions like this, showing the filth under USDA inspection, is a national disgrace. [Slide.] These cages are dirty and inadequately sanitized.

[Slide.] The monkeys try to reach for food in fecal pans because they don't even have food bowls in their cages.

The fact that this occurs and we have an Animal Welfare Act already indicates that the inspectorate is inadequate and the intrinsic inadequacy in the act, especially related to the lack of veterinary care, with this self-mutilated monkey [slide].

[Slide.] Picking at wounds, further self-mutilation, because they are bored. They have nothing else to manipulate except themselves and the cages.

Let us move quickly now. [Slide.] This shows further amputations.

Veterinary treatment should be given.

We need an alternative to this. I have already suggested the free-moving animal.

We have about 10 more slides.

[Slide.] Some animals are kept in stocks like this, for 3 months, 6 months, and longer. Is this really the only way that we can treat them?

A number of experiments, I think we should define ethical parameters and reject certain experiments as the ends not justifying the means. [Slide.] Such as smoking beagles and baboons [slide].

A number of high school studies.

[Slide.] Such as putting hair spray into a kitten. This is not science. This is cookbook science.

And even adults are guilty. [Slide.] Psychologists here are drowning a rat, rather like giving a dog repeated electrical shocks without escape.

These are experiments called "learned helplessness" which are supposedly a model for depression in man.

Thank you.

I would like another 20 seconds now to summarize.

Mr. WALGREN. Please do.

Dr. FOX. The effect of the benzodiazepines in the relief of anxiety can be readily demonstrated in experimental animals. These are substances in the brain of common laboratory animals such as rats, which in man are associated with anxiety, and there are very specific receptors for valium, and yet look at the end of this sentence [slide]—"However, anxiety in the rat and man can hardly be equated."

There is very clear evidence from brain biochemistry that animals have the same neurohormonal systems mediating many of the emotions that we do. This enjoins us on the basis of scientific proof to treat them with compassion and respect.

They are also very intelligent, if we take time out to observe them and not just regard them as convenient tools. [Slide.] This is a rat in a smoking study. It is in a jar and smoke is being puffed in through a tube. In order to stop the smoke from getting at it several rats got hold of their feces and shoved the feces into the tube to block the smoke from coming in. I doubt that under similar circumstance I would have such insight. [Laughter.]

The brains of animals are very similar to ours in the basic biochemical and physiological structure.

There are certain kinships which some people feel are anthropomorphic, but there are kinships which are physiological and psychological. Animals suffer anxiety and depression. They also experience joy and pleasure, physiologically and psychologically.

And finally we are enjoined today, I believe, to consider the welfare of these animals. If we continue to ignore their welfare the greater benefit that can be accrued to this society by greater sensitivity toward all life would in fact be negated. This is an ethical imperative as well as a scientific imperative because animals that are not optimally cared for will jeopardize scientific progress.

Thank you.

[The prepared statement of Dr. Fox follows. A longer statement appears in the Appendix.]

STATEMENT OF DR. MICHAEL FOX, SCIENTIFIC DIRECTOR, HUMANE SOCIETY OF THE UNITED STATES

Mr. Chairman, members of the Committee, I am Dr. Michael Fox, Scientific Director of The Humane Society of the United States. I appreciate having the opportunity to testify before you today on a matter of great importance to our 140,000 constituents. The subcommittee is to be commended for its willingness to examine the complex issue of animal use in biomedical research and testing. We believe that there are many changes that can be made in current law which would not jeopardize the quality of research and testing in the United States, but which would alleviate the intense pain and stress inflicted on animals.

ISSUE BACKGROUND

Every year, between 60 and 100 million animals, including primates, pigs, cats, dogs, guinea pigs, hamsters, rabbits, birds, rats and mice, are used in biomedical programs. These animals are used in high school biology classes and projects, medical and biological research, drug development, testing household products, cosmetics, and other chemicals, psychology research, and weapons and other military research. A large portion of this research and testing is financed by the federal government - predominantly through the National Institutes of Health, the National Science Foundation, Department of Energy, Department of Defense, Environmental Protection Agency, Food and Drug Administration, Consumer Product Safety Commission and other government agencies. Private industries, such as pharmaceutical and chemical companies, spend large sums on research and testing as do universities, medical schools, and private foundations.

TYPES OF EXPERIMENTS

Generally, lab animal use falls into three categories: education, biomedical research, and safety testing. Animals are routinely injected with poisonous substances, radiated, artifically stressed, infected with disease, handled and experimented on by unskilled students, and administered electric shocks. The majority of lab animals, however, are used in new drug development and toxicity testing by manufacturers of medicines, pesticides, cosmetics, and household products. Under present law, the animals in the lab are at the complete mercy of the person in charge of the test procedure.

TWO MAJOR FACETS OF THE PROBLEM

I recommend that the Subcommittee focus considerable attention on the two major facets of the laboratory animal issue: First, the type of care, feeding, handling, and experimentation that should be permissable for animals that will be used for experimental purposes. Second, the need to find additional methods of research and testing which will not require the use of animal subjects. We recognize that until changes are made in the scientific arena, animals are going to be required in some testing procedures. However, we do not want these animals to be subjected to the intense pain and suffering associated with research except when it is absolutely necessary for the safety and health of mankind and animals. Alternative methods of testing are needed, not only to alleviate the suffering of animals, but to make research and testing less expensive and more efficient. We need to insure that animals are treated as humanely as possible while their presence in science is required, but, as the same time we must be strenuously seeking additional methods of achieving the results desired by the scientific community which would not require animals' use. Both goals are achievable if only proper incentives existed. We believe that because the public is becoming increasingly concerned about abuses in laboratories, the pressure is building to make the scientific community more responsive to these concerns.

We do not believe that there are very many scientists who enjoy inflicting pain on animals. Rather, we believe that when scientists work with animals for a long period of time in a laboratory setting, they become desensitized to the animals' needs and only view the animals as part of the laboratory equipment. For that reason, the public concern for the animals must become a legitimized concern to be recognized and dealt with by the scientific community.

HUMANE CARE FOR ANIMALS IN LABS

We enthusiastically endorse the provisions of H.R. 4406 introduced by Congresswoman Schroeder of Colorado. The bill would amend the Animal Welfare Act to provide protection for animals during actual research, testing, teaching, experimentation and production of certain scientific, medical, commercial or veterinary products. Under provisions of the bill, any animals to be used in experimentation, rats and mice included, shall be humanely treated, properly fed, and suitably housed and cared for without pain under the supervision of personnel trained in animal care. The bill provides a working definition for pain. Animal Care Committees would be established by each facility to decide if and when animals could be used in painful experimentation.

Under present circumstances, a research scientist can do whatever he or she wants to do to an animal, regardless of whether or not it is likely to cause great pain and suffering. If research involves pain, the researcher would, under the provisions of this bill, be required to give pain killers to the animals involved if the pain killers did not interfere with the experiment. Animals could not be used for a series of experiments and then used for an entirely new set of experiments. Under current provisions of the Act, an animal used in an experiment does not have to be humanely killed when the experiment ends. In many cases, the researchers ignore the fact that the animal is still alive and in pain, and let it die a prolonged death rather than quickly ending its misery. The legislation directs them to kill the animal once the experiment is over if the animal could not live a normal life due to having vital organs removed, etc. The legislation would empower the institution's Animal Care Committee to review all research proposals to ensure that research is both meaningful and humane.

The bill does not attempt to end animal research nor will it prevent legitimate and necessary animal research. The bill strives to strike an acceptable balance between the needs of scientific research and the concerns of the mainstream animal welfare movement.

The bill does not attempt to promote the research for alternatives to laboratory animals. Such legislation is needed but is addressed in bills introduced primarily for that purpose. The bill also does not affect routine clinical veterinary practice nor will it affect farm animals and horses.

The better research institutions already have Animal Care Committees, including veterinarians, which address many of the issues raised by the bill. Each facility would merely have to keep a brief record of its deliberations and submit a summary of this record to the U.S. Department of Agriculture as part of its annual report already required by law. The bill will ensure that all institutions set up and operate committees to review, from an ethical and scientific viewpoint, proposed research projects and will provide these institutional committees with the power of law to support their decisions.

The cost to the government is negligible. The duties of the Animal and Plant Health Inspection Service, which already has the responsibility of enforcing the Animal Welfare Act, would be increased slightly. The cost of not passing this legislation is continued abuse of animals and widespread suffering in laboratories and research facilities.

THE NEED FOR ALTERNATIVES

In a civilized society such as exists in the United States, the unrestricted use of animals in research and testing cannot be tolerated indefinitely. Such use can only be justified currently because of its overwhelming need for health and safety purposes. We know American scientists are capable of developing alterantives such as cell and organ cultures, microbial systems and computer models that improve efficiency, as well as make possible ethical clinical and epidemiological research. Finding other alternatives is a natural progression of science if only our energies are channeled in that direction.

However, no incentives presently exist for finding additional alternatives. The nation's scientific community seems to have a definite prejudice in favor of research which involves using the most advanced animal species. For example, it is more prestigious within the research community to experiment on primates than on mice. The U.S. government spends approximately $18 million a year for the support of primate research alone, but only a few hundred thousand dollars are available for cell culture support. As long as this type of priority exists, alteratives will not be actively developed and utilized. Several bills are pending before this Subcommittee to promote the use of alternatives. We urge the Subcommittee to examine all of them closely as they all would do much to reverse the current trend towards using more animals rather than fewer. As much as we would like to have seen the scientific community voluntarily find and utilize alternatives, we are convinced that only a congressional mandate will bring about significant change.

Now is the time to begin this process. Even the American public has voiced its concern over the validity of much animal testing. Time and time again the public is told that if you force feed several thousand mice a certain substance, it will cause cancer in the mice and subsequently in the bodies of humans. However, people recognize that a human's system is not exactly the same as that of a mouse, nor does a test which requires such massive amounts of substances to be used in mice necessarily result in data that is reliably extrapolated to humans.

Mr. Chairman, there is no better time than the present to begin our quest for finding alternative testing procedures. Congress is concerned with the budget and we know that using non-animal methods is less expensive as well as more reliable than continuing to procure animals and provide for their adequate support and care.

We recommend that the Congress institute a comprehensive program to address this problem and would be more than willing to sit down with the Subcommittee and its staff to discuss in more detail the various legislative avenues which would bring about a constructive change.

BETTER ENFORCEMENT OF EXISTING LAW

The recent example of mistreatment of animals exposed by Alex Pacheco of People for Ethical Treatment of Animals indicates that very real problems exist in the enforcement of the current law to protect laboratory animals.

Under the Animal Welfare Act, the U.S. Department of Agriculture is responsible for ensuring that facilities using laboratory animals are in compliance with standards of laboratory animal welfare described by the Regulations (9 C.F.R. § 1.1 et. seq.) The Department of Agriculture, Animal and Plant Health Inspection Service, fulfills this responsibility in two ways. The Humane Society of the United States, concerned that deficiencies exist in provisions intended to ensure the welfare of laboratory animals, conducted a study of the USDA annual reporting system to assess whether the system as it now functions adequately fulfills the requirements and the intent of the Animal Welfare Act and its regulations.

A large number of deficiencies and inconsistencies were identified within the reporting system originating both within the research facilities and within USDA-APHIS. These problems can be separated into three categories: errors in reporting; evidence of inadequacy of the Regulations; and evidence of lack of enforcement by USDA. USDA errors in reporting included misrepresentation of numbers and species of animals used overall, numbers and species used in painful research, and status of research facilities. Research facility deficiencies included failure to report, failure to provide an adequate explanation of research involving pain where pain-relieving drugs were withheld, and inconsistency in defining pain.

Evidence of inadequacy of the Regulations included failure of the Regs to provide a definition of "pain," and failure to adequately define "routine procedures" and acceptable explanations for withholding pain-relieving drugs. Evidence of lack of enforcement included acceptance of inadequate reports, altering reports, and the overall USDA enforcement record.

HSUS feels that even though funding for the U.S. Animal and Plant Health Inspection Service is not what it should be, much better enforcement could be provided. We can understand, although not accept, that there is a lack of personnel to visit the facilities as often as is necessary to ensure compliance. However, we cannot accept the fact that when an inspector visits a facility replete with blatant violations of the law, the facility is not cited. And, in the few instances where abuses are found, prosecution is unheard of.

As long as the laboratory community feels that it has nothing to fear from USDA, then compliance with the Animal Welfare Act will be considered only an option rather than a must.

IN CONCLUSION

Mr. Chairman, in conclusion I would like to say that inhumane treatment of animals in laboratory facilities is not a necessary evil which we must tolerate. Rather, it is through carelessness and insensitivity, as well as a lack of attention to the issue, that has led us to the point where we are today. I urge this Subcommittee to act in the very near future to bring about needed changes. You will have heard much about the problems during these two days of hearings. We are confident that you will recognize that reasonable solutions exist which can be supported by all involved.

Mr. **Walgren**. Thank you very much, Dr. Fox.

We will proceed with the rest of the panel and then come back for discussion with the whole group.

As you can see, we are going to be flexible with that time limit, and we do not want to cut anybody off, because the thought is more important than the time. However, if we both give a good effort to that I am sure that the hearing will move along just fine.

Next I would like to turn to Christine Stevens from the Society for Animal Protective Legislation.

STATEMENT OF CHRISTINE STEVENS

Mrs. **Stevens**. Thank you, Mr. Chairman.

On behalf of the society I wish to recommend prompt enactment of H.R. 4406. We disagree with USDA's opposition to this bill as much as we deplore its shameful irresponsibility in the case of the Silver Spring monkeys which, I want to emphasize, is not the worst case. What it is is the best-documented case of laboratory animal abuse.

The United States uses more animals for testing and research than any other country in the world, but our regulations to assure avoidance of unnecessary pain and suffering are much less definite than those of most other developed nations.

We believe that the provision in the Schroeder bill for public members of the Secretary's Advisory Committee is exceedingly important, and we suggest that this principle be extended further to include two public members on each of the institutional committees designated in the bill to oversee decisions on experimentation at each institution.

Further, we believe that public members should be added to the final NIH review of grants for the specific purpose of considering what it is proposed to do to animals in the course of the study.

One of the difficulties in obtaining sound protection for laboratory animals without inhibiting useful research has been the tendency to secrecy on the part of experimental laboratories. When animals are well treated in such institutions there is no need for secrecy.

However, the National Institutes of Health has taken a protective stance, not only with regard to well-conducted research in institutions where animals receive good care, but unfortunately the protective attitude has sometimes extended to cases in which NIH itself should have been taking prompt, effective corrective action.

To get a historical perspective on this I brought with me a copy of a report which NIH itself prepared and then suppressed, and you have a full Xerox of this, Mr. Chairman.

As you can see it is a substantial 210-page publication, prepared at public expense. It was an objective study to which all interested parties were able to contribute, but NIH did not wish the Congress to have this information. We hope that NIH has now abandoned such tactics.

To its credit it has suspended the funding of grants at IBR. However, in 1977 Dr. Clark wrote these reassuring words about that same laboratory:

For your information, grant HD-08579-03 terminates on April 30, 1977. Should any further support be considered, appropriate steps would be taken to assure compliance with the Animal Welfare Act.

How discouraging, then, to find an even larger grant being given in 1981, at the same time that the filthy conditions in the laboratory and lack of adequate veterinary care were so clearly documented.

The USDA inspectorate also failed to deal with this situation. It is worth summarizing the statements of the USDA veterinarian responsible for inspecting IBR, made under oath in the Rockville County Circuit Court on September 29.

And in connection with that summary, I would ask to have placed in the record the statement by Fay Brisk who has analyzed a great many other inspection reports by the U.S. Department of Agriculture.

Mr. WALGREN. Without objection, the committee will receive that report for inclusion in the record.

Mrs. STEVENS. Thank you, Mr. Chairman.

[The information follows:]

October 13, 1981

Statement by

FAY BRISK, FORMER DIRECTOR, WASHINGTON HUMANE SOCIETY ANIMALPORT
WASHINGTON NATIONAL AIRPORT

Before the HOUSE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY

As a former Pennsylvania newspaperwoman who has been a director of local and national humane groups, I thank the Chairman for these hearings and submit my comments for the record.

My comments are based on my own investigation into the U.S.Department of Agriculture's animal welfare policies and inspection procedures. I found that not since the landmark Laboratory Animal Welfare Act* was passed in 1966 has there been such a need for swift and drastic reforms!

As one of the pioneers of that Act, I have worked with USDA for the past 15 years, primarily as a self- appointed watchdog, concerned for its enforcement. Some months ago, I became alarmed at USDA's leniency toward laboratory animal dealers. These dealers receive tax dollars from the laboratories that operate with grants from the National Institutes of Health, and it was their abusive practices that led Congress to pass the 1966 Act. Yet, when I asked USDA for a list of these dealers licensed under the Act, I was told there was no list.

(more)

* Now known as the Animal Welfare Act

Then, when an already too slim budget was further reduced in Pennsylvania, a major research state, I considered that was going too far. Pennsylvania is a key supplier of laboratory animals on the East Coast and, with the exception of New York and California, has more registered research laboratories than any other state. I suspected that the entire laboratory animal program was going down the drain. Under the Freedom of Information Act, I asked for USDA's inspection reports-- not only for Pennsylvania, but for surrounding states as well.

Here is what I found:

Out of nearly 200 reports that covered all types of dealers and some laboratories, scarcely more than 15 percent noted deficiencies. In the remainder, all 48 items listed on the report form-- ranging from sanitation to veterinary care-- were checked off as "adequate." The space reserved for the signature of the reviewing officer (the veterinarian in charge) was frequently blank. Did this mean that the reports were simply filed-- and forgotten? Even if they were signed, there was no indication that anyone paid any attention to those that were false or misleading. For example:

-- In Pennsylvania, a USDA inspector consistently found nothing amiss at a well-known animal auction that sells to laboratory animal dealers. Humane groups have been complaining about this auction for years. But the reports showed that the inspector always made his inspections early in the day-- long before any animals were brought in to be sold.

-- In New Jersey, a laboratory animal dealer has been receiving a perfect score for a mythical "kennel" year after year, for 10 years. This dealer doesn't have a kennel in New Jersey, only an old dairy barn, where he tied up a few dogs from time to time. He buys his dogs in Virginia, transports them directly to laboratories.

-- In Washington, D.C., a USDA inspector turned in a report for a research facility, checking off as "adequate" trucks and other equipment the facility doesn't have. Three days later, he turned in another report on this same facility. Had he forgotten he had been there?

But even when reports have shown serious violations, USDA has been slow to prosecute those who are laboratory animal dealers. One wonders why a case against a major laboratory primate supplier has been pending for two years, and why memos still are going back and forth from Washington to the field. This supplier was accused of repeated violations of the 1976 humane transport amendment to the Animal Welfare Act. Yet, USDA hasn't hesitated to prosecute other animal shippers for the same violations.

And in Virginia, a laboratory animal dealer with a long string of violations dating back to 1978 is still persuading inspectors to give him another chance!

Since USDA does not maintain a separate listing for laboratory animal dealers, the number of these dealers prosecuted during the past 15 years remains a mystery. According to USDA's own records, prosecutions for all licensees and registrants totaled 127 for the period 1968-1980. Of this number, 47 (nearly 38 percent) were in three states-- Iowa, Kansas and Missouri. And only one laboratory, out of the 1,000 that are registered, was prosecuted for conducting research under inhumane conditions. That was 11 years ago.

All this was brought to the attention of USDA's Veterinary Services and higher officials early this year. In June, I submitted a memorandum and a statistical chart to USDA, pointing out that recent Senate Labor and Human Resources Committee hearings on the National Cancer Institute showed what could happen when government fails to monitor facilities receiving the taxpayer's dollar. USDA, I wrote, "must make certain that a similar oversight does not exist in its own Department."

But it wasn't until police rescued those 17 monkeys from a Silver Spring laboratory that USDA officials dusted off that memorandum.

What is important now, however, is not to dwell on who is to blame for conditions in that laboratory-- and possibly many others. We must prevent it from happening again.

Those of us who remember the atrocities committed by laboratories and their suppliers before the Animal Welfare Act was passed do not want to go back to those nightmares. We do not want any more animal Buchenwalds from coast to coast. The Act has done some good. It can do better.

But it can do better only if USDA shapes up, if it completely reorganizes its animal welfare program, puts someone who cares about it in charge (it should be administered directly by the Administrator of the Animal and Plant Health Inspection Service), and agrees to work it all out with a public advisory committee. And it should be given enough money to do the job.

In any event, with legislation that will provide alternatives to animal testing, there will be fewer animals for USDA to inspect! #

Mrs. **Stevens**. In response to a question the USDA inspector said, and I quote:

"I consider all researchers at these large research facilities"—and that includes IBR—"as responsible." You can read additional remarks of his in my prepared testimony.

USDA has specialists selected for their interest, experience, and training to serve as backup for the multipurpose inspectorate who report to the regional headquarters.

Although there are now only seven of these specialists—there should be more—to cover the entire United States, increased emphasis on their duties and use of a central coordination—this is essential—with the Administrator of the Animal and Plant Health Inspection Service, could cut through the terrible inadequacies of enforcement, if the Congress requires USDA to act.

By the same token the current system employed by the National Institutes of Health to carry out its principles for use of animals is a dismal failure. It relies entirely on the good faith of the institutions' animal care committee, a report and an assurance from which forms the basis of NIH approval of the way animal experimentation is conducted.

Bringing public members into institutional animal care committees and into the Secretary of Agriculture's Advisory Committee through H.R. 4406 and adding them to site-visit teams for NIH will make possible more careful and sensitive oversight without the need to increase Federal spending for salaries. This is important in a period when Government expenditures must be kept low.

The National Institutes of Health has had experience integrating public members into local institutional committees that review protocols for experiments on human subjects. We believe a similar system must now be put in force for animal subjects, Public Law 93-348, title II requires public members on the human subject committee.

The extremes of pain and suffering that animals may undergo needs a different kind and degree of consideration. One of the areas most likely to cause such extremes of pain is brain experiments on conscious paralyzed animals. And I would submit a recent paper on this subject. A publication of the Animal Welfare Institute, "Physical and Mental Suffering of Experimental Animals" reviews the 1975 to 1978, scientific literature, and I would submit a 1981 paper, just to give you a picture that such experiments are going on and on.

Cats were treated with local anesthetics after extensive surgical interventions. The cats were immobilized with curare-like substances, and data collection started 1 to 3 hours after they became fully conscious. They had no way of showing whether they were feeling pain nor could they demonstrate their fear, which may be even more extreme.

Regarding alternatives I will be very brief. I want to emphasize the funding must be supplied to develop alternatives. The subcommittee will have to decide the level of the recommended funding. However, in so doing I hope, Mr. Chairman, you will bear in mind the size of Government expenditures that are now going directly into the pockets of commercial animal breeders and dealers.

For example, the world's biggest breeder of mice, Charles River Laboratories, has a $6,400,000 grant, a Government contract from 1980 to 1983 to operate a "Primary Genetic Center for Rodents in Biocontaminant Environments." This is just one single contract, paid from tax funds, to a company which is making fat profits from extensive sales to nongovernmental enterprises.

In contrast, no tax funds at all have been allocated for the specific purpose of replacing animals in tests or reducing the numbers required, and this, despite the fact that those nonanimal tests which have been developed are far less costly in both money and time.

In conclusion I would like to emphasize that the Animal Welfare Act has never had adequate funding. It cannot be further cut without destroying its ability to curb abuse of animals.

We strongly urge this distinguished subcommittee to do everything in its power to prevent further cuts in enforcement of a humane law unanimously passed by Congress, to strengthen that law by enacting H.R. 4406 with the attached amendments, and we urge that the best features of all the bills and resolutions relating to alternatives be combined by the subcommittee and enacted.

Thank you, Mr. Chairman.

[The prepared statement of Mrs. Christine Stevens follows:]

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TESTIMONY ON PENDING LEGISLATION AFFECTING LABORATORY ANIMALS

BEFORE THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY

by Christine Stevens, Secretary

October 14, 1981

On behalf of the Society for Animal Protective Legislation, I recommend prompt enactment of H. R. 4406 to amend the Animal Welfare Act to insure the humane treatment of laboratory animals.

The United States uses more animals for testing and research than any other country in the world, but our regulations to insure avoidance of unnecessary pain and suffering are much less definite than those of most other developed nations, notably the western European democracies. The time is long past when we should have caught up with other nations in this field.

We believe that the provision in the Schroeder Bill for public members on the Secretary's Advisory Commission is exceedingly important, and we suggest that this principle be extended further to include two public members on each of the institutional committees designated in the bill to oversee decisions on experimentation at each institution. This provision is needed in order to prevent the type of callousness which, unfortunately, has often been found to develop in the laboratory situation.

I would like to precede these remarks with the fact that the Society for Animal Protective Legislation and the other organization with which I work closely, the Animal Welfare Institute, are in no way anti-scientific. Indeed, much of our work depends on carefully documented scientific information in many different fields. However, during the course of my many visits to laboratories I learned that sensitivity to the feelings of experimental animals is often minimal with the result that the animals suffer unnecessarily, and in many cases the research also is harmed for lack of attention to the animals. Part of the reason for this is the double standard which scientists and technicians may apply in considering animals. Another reason is that scientists may not visit animal rooms at all; and if they do, their particular discipline may not provide in any way for assessing the condition of animals either physically, emotionally or mentally.

In an attempt at solving some of these problems through education, the Animal Welfare Institute, which I serve as president, has published Comfortable Quarters for Laboratory Animals and Physical and Mental Suffering of Experimental Animals, A Review of Scientific Literature 1975-1978, whose headings reveal different categories of painful procedures reported in scientific journals: Eye Manipulations, Burn Experiments, Noble-Collip Drum Trauma, Radiation Research, Brain Research, Electric Shock Research, Aggression Research, and Stress Experiments.

Many scientists are unaware of what is happening in laboratories other than their own. Indeed, even when experimental work in their own discipline is involved, it would be very unusual for one scientist to see the actual animals used by another scientist. I have found quite often that my request to visit a laboratory resulted in a scientist seeing all the animal rooms in his institution for the first time.

We believed when the Laboratory Animal Welfare Act was passed that the inspections by veterinarians of the U. S. Department of Agriculture would effectively introduce third party observation by persons whose D.V.M. degree guaranteed some scientific training and would end the major abuses which we very frequently observed prior to enactment of this law in 1966. We know that passage of the law resulted in significant progress. We observed the replacement of cramped cages with broken doors and floors capable of cutting animals' flesh. We observed a substantial improvement in sanitation in many cases. However, the Veterinary Services of the Department of Agriculture which conduct laboratory inspections have been starved for funds, and a really effective inspection system has never been implemented despite constant efforts by concerned organizations to improve enforcement of the law.

Need to Add Public Members and Streamline Chain of Authority in USDA Inspectorate

Based on experience over the years, we believe the time has come to provide for other outside checking since it appears that the familiarity which has bred callousness in some laboratories has done the same for some of the veterinary inspectors of the U.S. Department of Agriculture. The information documented at these hearings clearly demonstrates the need for better enforcement of the Animal Welfare Act, better training of inspectors, and a more efficient and expeditious chain of command so that bad conditions can be promptly reported and rectified. The Schroeder Bill will undoubtedly assist in this effort, and we suggest the addition of the following words "and two members of which shall be members of the public not connected with the institution. They shall be selected for their interest in and knowledge of animal welfare and care. It shall be unlawful for any member of an animal care committee to disclose any secret or confidential information obtained as a result of being on the committee and members shall sign any appropriate undertakings in this regard."

Further, we believe that public members should be added to the final NIH review of grants for the specific purpose of considering what it is proposed to do to animals in the course of the study. We are not suggesting that laymen should attempt to inform themselves to the extent that scientists in the discipline are informed. However, we suggest that those selected should have a particular interest in the welfare of animals and that their input on that aspect of the research should be given consideration.

In 1978 the National Institutes of Health made several improvements in guidelines on the treatment of animals. However, the implementation of these guidelines, like the enforcement of the Animal Welfare Act, appears to be too often honored in the breach. NIH site visits have not been successful in addressing animal welfare concerns. The time has come for the taxpayer to be represented when decisions on substantial funding for animal experiments are made. The 3-day symposium conducted by the National Institutes of Health in February of this year showed that scientific concerns and animal welfare concerns often coincide and that there is no insuperable obstacle to working together. However, it is important that the Congress should express its will to bring together the contributions which can be made by scientists, technicians, and animal protectors in institutions where animals are used for research, education, or testing.

The Problem of Secrecy

One of the difficulties in obtaining sound protection for laboratory animals without inhibiting useful research has been the tendency to secrecy on the part of experimental laboratories. When animals are well treated in such institutions, there is no need for secrecy. However, the National Institutes of Health has taken a protective stance not only with regard to well-conducted research in institutions where animals receive good care, but, unfortunately, the protective attitude has sometimes extended to cases in which NIH itself should have been taking prompt, effective corrective action. To get an historical perspective on this, I have brought with me a copy of a report which NIH itself prepared and then suppressed. As you can see, it is a substantial 210-page publication prepared at public expense. It was an objective study to which all interested parties were able to contribute, but NIH did not wish the Congress to have this information. We hope that NIH has now abandoned such tactics.

A significant sign of change has occurred in the case of the monkeys seized by the Montgomery County Police from the Institute for Behavioral Research. To its credit, NIH on October 8 suspended the funding of grants of more than $100,000 to IBR. Early NIH reactions to the news reports, however, suggested the old protective stance. Dr. William Dommel of the Office for Protection from Research Risks is quoted in The Washington Post, September 17, 1981, as saying that NIH was surprised to learn of bad conditions at the Institute for Behavioral Research. Yet two NIH officials, Dr. Roy Kinard, Animal Welfare Officer, Office for Protection from Research Risks, and Dr. Donald E. Clark, Chief, Office of Grants and Contracts, National Institute of Child Health and Human Development, wrote in 1977 to Fay Brisk acknowledging her complaint about the Institute. Indeed, Dr. Kinard wrote March 31, 1977: "First, the Institute for Behavioral Research in Silver Spring. I think we can look forward to that situation being cleared up, or should I say cleaned up." Dr. Clark, on March 28th of the same year, wrote these reassuring words: "For your information, grant HD-08579-03 terminates on April 30, 1977. Should any further support be considered, appropriate steps would be taken to assure compliance with the Animal Welfare Act." How discouraging then to find an even larger grant being given in 1981 at the same time that the filthy conditions in the laboratory and lack of adequate veterinary care were so clearly documented.

USDA Failure to Enforce the Animal Welfare Act; Further Recommended Action

The USDA inspectorate also failed to deal with this situation. It is worth summarizing the statements of the USDA veterinarian responsible for inspecting IBR, made under oath in the Rockville County Circuit Court September 29, 1981. Under his jurisdiction as an inspector are "close to sixty" research facilities. He has worked for the U. S. Department of Agriculture for 23 years, yet he showed little familiarity with the regulations he was charged to enforce. Although the Animal Welfare Act gives him no authority with regard to the design of animal experiments, this was the area in which he expressed the liveliest interest.

He said he had "discussed protocols" on a number of occasions with the director of the laboratory. "I have been reading his articles over the years to increase my knowledge about that facility," he said, and he indicated that he had additional ones "in my possession and plan to read them because I am very interested."

In response to another question, he said, "I consider all researchers at these large research facilities . . . as responsible." Is it possible that an indiscriminate attitude of reverence towards all scientists could cause a veterinary inspector to be oblivious to the most gross lack of sanitation, to filthy bandages slowly disintegrating, open wounds, cage floors with heavy projecting wires that cut animals, huge piles of molding feces and food thrown on the floor often falling into the pans full of urine below the wire mesh floor? Asked a question about feeding pans, he said, "I can't recall. It's not absolutely required that they be in the cages while I'm there."

When this USDA inspector registered the research facility, he acknowledged that he did not measure the small cages it contained. He claimed that this was "not required." "In my professional judgment," he said, "the cages are adequate." He characterized them thus: "They're galvanized cages; they're durable cages." Though he never checked the dates on the feed bags and had never met the laboratory's veterinarian, he seemed quite concerned that he had missed seeing a washroom which he described as having "a false door . . . painted the same color as the wall and it had a little tiny doorknob. Nobody was trying to hide it; I just missed it."

Thus his testimony made plain that the welfare of the animals--the purpose for which the Animal Welfare Act was enacted by the Congress--had a very low priority in his mind. The feeding, watering, veterinary care, cage cleaning and cage size seemingly had no interest for him, yet these are the points having the greatest bearing on the extreme distress experienced by the monkeys.

Although the Rockville hearings were conducted for the purpose of determining custody of the animals, they provided a shocking view of the nature of federal inspection in a major research area of the nation, perhaps more conclusively than a Congressional oversight hearing would have been likely to demonstrate. Current USDA practice in administering the Animal Welfare Act is permitting extreme abuses to continue without any effective action being taken. While this inspector, who covers all laboratories using animals in the wider metropolitan area, is in the habit of checking off all the items on his inspection sheet as meeting all requirements, others who visit the same laboratories find deficiencies of a very serious nature, witness the photographic evidence in this case.

Investigation Needed

We urge this distinguished Subcommittee to request a full investigation by USDA of its current inspection procedures and prompt removal of unsuitable inspectors who show bias and inability to recognize even gross disregard of the minimum standards promulgated under the Animal Welfare Act. Further, we suggest that members of the public, including representatives of humane organizations, be formally included in the legislation so that the tendency to become accustomed, and thus insensitive, to inadequate care of captive animals may be guarded against. There should be a way whereby the public members of the Advisory Committee which would be set up under H.R. 4406 would be empowered to make unannounced inspections of the laboratories in the company of a USDA inspector or another Committee member, and public members should be situated in each of the different Regions of the country so that they could coordinate with the Veterinary Regional Directors under the USDA system. After the revelation of incompetence, insensitivity, and bias at the Rockville hearings, it would be impossible for an animal protective organization to recommend a simple continuance of USDA inspections as currently conducted.

Close observers of the USDA inspectorate have suggested that continued use of veterinarians whose primary duties are the prevention of spread of livestock disease, is unsuitable for the inspection of small animals in laboratories. USDA has specialists, selected for their interest, experience and training, to serve as backup for the multi-purpose inspectorate, who report to the regional headquarters. Although there are now only seven of these specialists to cover the entire United States, we believe that increased emphasis on their duties and use of a central coordination with the Administrator of the Animal and Plant Health Inspection Service could cut through the inadequacies of enforcement if the Congress requires USDA to act.

We urge, therefore, that this distinguished Subcommittee exercise its oversight powers by instructing the Department of Agriculture to use its specialists to make an unannounced visit to every registered research facility in the course of this year and to compile the results in a concise report to the Subcommittee at the end of the year. The specialist for the northeast region had never visited the Institute for Behavioral Research. The repeated visits made by an inspector whose incompetence and bias became a matter of record at the recent custody hearings on the monkeys were worse than useless. Payment of his salary and the time he took making the visits was not only a total waste of taxpayers' money but a severe hindrance to administration of the Animal Welfare Act unanimously passed by the Congress.

NIH Principles' Failure to Prevent Cruelty; Public Members Needed

By the same token, the current system employed by the National Institutes of Health to carry out its "Principles for Use of Animals" under "Responsibility for Care and Use of Animals" demonstrates the same dismal failure in the case of the unfortunate monkeys. It relies entirely on the good faith of the institution's Animal Care Committee, a report and an assurance from which forms the basis of NIH approval of the way animal experimentation is conducted. In the case of the monkeys, the Committee informed NIH in writing that the animal rooms were clean and the treatment of the animals was humane and that was the end of the matter. Although these statements were untrue, the present system employed by NIH contains no provision for a correction to reach the appropriate authorities.

We believe that responsibility for care and use of animals should be changed to correspond more closely with the system NIH currently uses with respect to their grants for research on human subjects. In the case of human subjects, public members are included on the institutional committees which review the protocols prior to conduct of the research. Public Law 93-348, Title II, Protection of Human Subjects, contains the relevant legislative information. I am informed that the local boards, including both scientists and lay people who are knowledgeable in the field or who have a special interest in the ethics involved, are working well, by and large. We urge that a similar requirement be included in H.R. 4406 in an effort to prevent the same phenomenon of blindness to the interests of experimental subjects which triggered this action for the protection of human subjects and which clearly affects animal subjects at least as much.

In addition to public members on the institutional committees, we believe that NIH should include public members on their site visit teams as well. It is our understanding that at this time there is no systematic scrutiny of animal welfare during site visits. Although the irregularity of site visits and the long periods between them prevent them from forming an adequate inspection system, nevertheless it would provide a valuable backup, and institutions and researchers would recognize that the welfare of the animals would be critically examined at the time of the visit. This need has long been recognized.

Why NIH Site Visitors Have Overlooked Animal Welfare

At a meeting at NIH in 1977, criticism of the inadequacy of site visits from the standpoint of animal health and welfare was made by scientists attending the meeting. It is well known that scientists and technicians within an institution are often unable to obtain needed changes in the care and treatment of animals. Senior staff members may refuse to allow any changes to be made. Indeed they may block advancement for persons who even request them, and the fear of such action prevents improvements from even being considered.

An example was given at the NIH meeting of an individual who placed his hopes for obtaining reasonable sanitation and ventilation in one of the animal rooms on an NIH site visit which he knew was scheduled; but the visiting team walked through the room, whose ammonia content was so high that it brought tears to the eyes, and gave it their full approval. It would have been easy for the site visitors to insist on cleanliness as a precondition to receiving a research grant using the animals, but they did not bother to do so. Why? First because bad conditions of the past have led to their acceptance as the norm, and second because individuals whose training and interests would cause them to give consideration to animals are not necessarily included in site visit teams. This should be changed. Members of the public interested in animal welfare should be included in such visits.

Further, an amendment to H.R. 4406 to protect humane scientists and other personnel should be included as follows: "An individual working at a registered research facility has the right to notify the Chairman of the Animal Care Committee at that facility of abuses in animal care. All personnel must be given written notification of the right to this procedure."

Improve Supervision and Save Tax Funds

Bringing public members into institutional animal care committees and into the Secretary of Agriculture's advisory committee through HR 4406 will make possible more careful and sensitive oversight without the need to increase federal spending for salaries. This is important in a period when government expenditures must be kept low.

Public members of these committees can assist, too, in seeing to it that the quarters for laboratory animals are comfortable and suitable for them without expenditure of unnecessarily large sums. Unlike research institutions, humane society shelters get no grants from the federal government. Through necessity, these organizations have learned to economize. The housing of the Institute of Behavioral Research primates in a private house at a total cost of $3000 for the necessary construction, contrasts dramatically with the cramped, dangerous and filthy housing by IBR itself despite its 1981 grant of $136,000 from National Institutes of Health.

There is no doubt whatsoever that government expenditures can be reduced by utilizing the experience and understanding of private citizens and humane organizations willing to give their time to improving the lot of laboratory animals. Comfortable Quarters for Laboratory Animals, a copy of which has been submitted to subcommittee members gives examples of a wide variety of suitable housing for all the commonly used species.

The National Institutes of Health has had experience with integrating public members into local institutional committees that review protocols for experiments on human subjects. We believe a similar system must now be put in force for animal subjects through amendment of HR4406, as noted earlier, and through amendment of Public Law 93-348 followed by promulgation of appropriate regulations.

The case of the Silver Spring monkeys brought to light the need for clarification of current NIH regulations on ownership of animals purchased by NIH grantees. At present, animals are classed as "supplies," and supplies may not be removed from a grantee under current rules. "Fixed equipment," on the other hand, may be reclaimed by NIH. Animals should be placed in this category for their protection against abuse. Clearly, the concept of animals is sadly in need of upgrading in a philosophy which calls them "supplies" and treats them as unqualifiedly expendable.

Brain Experiments on Paralyzed Animals

It is not only their lives but the extremes of pain and suffering they may undergo that needs a different kind and degree of consideration. One of the areas most likely to cause such extremes of pain is in brain experiments on paralyzed animals. I would cite a paper from the August, 1981 issue of Experimental Neurology (Vol. 73, pp. 534-547).

Cats that underwent extensive surgical interventions were placed in stereotoxic instruments and injected with a curare-like substance. Wounds were treated with local anesthetics but the cats remained unable to move or to cry out or otherwise indicate their feelings. "Data collection began one to three hours after the cat was removed" from general anesthesia and continued with five minute recovery periods for as many as eleven trials of blowing up a balloon inside the cat's stomach. The paper states: "The number of trials was determined by the stability of the preparation." The "preparation" means the cat.

There is grave concern with experiments of this kind that severe suffering will go unrecognized. We recommend, therefore that on page 4 line 20 the following words be added: "If local anesthetics are used, the animal must be able to behaviorally demonstrate the presence of pain (paralytics may not be present)."

Coordination to Prevent Waste

The six bills and resolutions pending before this Subcommittee on the subject of alternatives to laboratory animals indicate the strong public support for government efforts in this field. We would like to emphasize that the word "alternatives" means not only complete substitution of animals, as is possible in some cases, but also reduction of numbers of animals when it is still necessary to use them, and reduction in pain and distress in experiments. It is in this latter area that the alternatives bills start to merge with H.R. 4406 which specifically addresses this problem.

We believe that the concept of the forum recommended at the end of the National Institutes of Health Symposium by NIH spokesman Dr. William Raub should be solidified into the form of legislation so that all government agencies using animals would report to a central source and carefully coordinate both any testing which they do with animals, which has often in the past been unnecessarily duplicated by another federal agency, and also their work, if any, on the development and use of alternative methods. Coordination is absolutely essential to avoid the waste which the Reagan Administration is focusing on so strongly.

There is no central government body to which proposals for the development of alternatives may be offered, nor is there any review of such proposals which would assist in encouraging high quality. The only work on alternatives is being done entirely by the private sector, and that has been purely in response to strong public pressure. The coalition of organizations that focused on the cruel Draize eye irritancy test succeeded in obtaining a 750 thousand dollar grant from Revlon to Rockefeller University and a million dollar grant from the Cosmetic, Toiletry and Fragrance Association to Johns Hopkins University. To my knowledge, no cosmetic company had ever made any contribution whatever to university research to spare pain to animals before. Equally unique was the grant by the New England Antivivisection Society to Tufts University Medical School and another sizable grant from several groups to the University of Pennsylvania Medical School. No American antivivisection society had ever made such a grant either. These highly unusual events must be followed up by solid government commitment to seek alternatives to animals in the ever-expanding testing requirements for all types of commercial products.

This hearing addresses the protection of animals from unnecessary suffering. This goal and the goals of obtaining maximum public safety and advancing the most effective economies possible are consistent with one another and should be a high priority for the government. One facet of this need might be covered by an amendment to the Public Health Service Act to create an alternatives coordinating committee similar to P.L. 93-354, the National Diabetes Mellitus Research and Education Act, a copy of which is attached to my testimony. Alternatives should be defined, as noted above, to make clear that they include not only replacement of animals but also reduction in their use in any given instance and refinement of the procedures used to eliminate or reduce physical and mental suffering to them.

Funding should be supplied. H.R. 220 and H.R. 2110 specify twelve million dollars a year for five years. We have supported similar legislation since it was first introduced by Congressman Drinan. H.R. 556 calls for more substantial funding for the development of alternatives. The Subcommittee must decide the level at which to recommend funding for this purpose.

Millions to Laboratory Mouse Breeder; Nothing to Development of Substitutes

In so doing, it should bear in mind the size of government expenditures that are going directly into the pockets of commercial animal breeders and dealers. For example, the world's biggest breeder of mice, Charles River Laboratories, has a $6.4 million government contract, 1980-1983, to operate a "Primary Genetic Center for Rodents in Biocontaminant Environments." This is just one single contract paid from tax funds to a company which is making fat profits from extensive sales to non-government enterprises.

In contrast, no tax funds at all have been allocated for the specific purpose of replacing animals in tests or reducing the numbers required, and this, despite the fact that those which have been developed are far less costly in both money and time.

Whatever the level of funding, it is essential that the federal government provide coordination for this important work.

Authorization of expenditure of six million dollars a year for enforcement of the Animal Welfare Act should be added to HR 4406 to assist in assuring essential funding for the Act.

With respect to H.R. 4406, we do not believe that any substantial increase in cost of enforcement would be incurred by enactment of this bill. I wish to address, however, the grave concern of humanitarians that current funding levels for the Animal Welfare Act, even as it now stands, are in danger of being seriously cut. The Animal Welfare Act has never had adequate funding. It cannot be further cut without destroying its ability to curb abuse of animals. We strongly urge this distinguished Subcommittee to do everything in its power to prevent further cuts in enforcement of a humane law unanimously passed by the Congress.

In summary, I would submit a list of the amendments supported by the Society for Animal Protective Legislation. We urge the Subcommittee to enact H.R. 4406 with these amendments and with a strong recommendation for adequate funding. We urge that the best features of all the bills and resolutions relating to alternatives be combined by the Subcommittee and enacted.

Public Law 93-354
National Diabetes Mellitus Research and Education Act

Sec. 5 (a) Part D of Title IV of the Public Health Service Act is amended by adding at the end thereof the following new section:

Diabetes Mellitus Coordinating Committee

"Sec. 436. For the purpose of —

"(1) better coordination of the total National Institutes of Health research activities relating to diabetes mellitus and

"(2) coordinating those aspects of all Federal health programs and activities relating to diabetes mellitus to assure the adequacy and technical soundness of such programs and activities and to provide for the full communication and exchange of information necessary to maintain adequate coordination of such programs and activities,

the Director of the National Institutes of Health shall establish a Diabetes Mellitus Coordinating Committee. The Committee shall be composed of the Directors (or their designated representatives) of each of the Institutes and divisions involved in diabetes-related research and shall include representation from all Federal departments and agencies whose programs involve health functions or responsibilities as determined by the Secretary. The Committee shall be chaired by the Director of the National Institutes of Health (or his designated representative). The Committee shall prepare a report as soon after the end of each fiscal year as possible for the Director of the National Institutes of Health detailing the work of the Committee in carrying out the coordinating activities described in paragraphs (1) and (2)."

Mr. WALGREN. Thank you very much, Mrs. Stevens.

The next witness is Nancy Anne Payton from the Massachusetts Society for the Prevention of Cruelty to Animals.

Let me emphasize again, I do appreciate people hurrying, but I do not want to hurry you too much, because we are more interested in the substance than the procedure. I want to thank the first two witnesses particularly for being so brief, and we will come back to them and all of you for questions and discussion. But I do not want to cut off urgent thoughts, so with that in mind, and you need not fear that you are going to be way out of line.

STATEMENT OF NANCY ANNE PAYTON

Ms. PAYTON. Good morning.

My name is Nancy Anne Payton and I am the humane issues analyst for the Massachusetts Society for the Prevention of Cruelty to Animals.

The MSPCA, founded in 1868, has evolved into a unique and sophisticated humane society with the broadest range of services for animals of any humane society in the United States. I appreciate the opportunity to explain our activities and experiences, particularly those pertaining to the use of animals in research. Briefly, highlights of our various services include 8 regional animal shelters, handling over 50,000 animals per year, 3 animal hospitals caring for 75,000 patients per year; the most notable of these facilities is the Angell Memorial Animal Hospital, located in Boston. We are affiliated with the American Humane Education Society, the World Society for the Protection of Animals, and the Tufts University School of Veterinary Medicine. We publish Animals Magazine which has a national circulation and we also have a 20-member law enforcement department unequaled by any other humane society.

The MSPCA law-enforcement officers are commissioned yearly by the Commonwealth of Massachusetts to enforce all State statutes relating to animal welfare. They are empowered with the authority to arrest and prosecute, and they have a 90-percent conviction rate. Each officer receives extensive training in animal welfare and is a graduate of the State Police Academy or an equivalent training program. At least one veterinarian is a commissioned law-enforcement officer and is assigned to the department to provide veterinary expertise and care.

Massachusetts General Law, chapter 49A grants MSPCA representatives inspection rights to State-licensed research facilities receiving dogs and cats from public pounds. This allows us access to approximately one-third of the research laboratories located in the State. Because each research facility is also registered under the Federal Animal Welfare Act the society has worked closely and effectively with employees of the U.S. Department of Agriculture. My experiences, coupled with those of our law-enforcement department, however, continually reveal disturbing shortcomings in the Animal Welfare Act, its regulations, its enforcement and its funding levels.

Central to the purpose of these hearings should be an examination of the Animal Welfare Act in relation to the growing public discomfort not over sanitary conditions, proper food or adequate water, but rather the actual use and rationale of the animals in research. Presently the act sends out two very clear messages to us at the MSPCA and the public. First, some animals are deserving of the act's protection, limited as it is, while many others are not. Second, animal investigators have privileges that others regulated by the act do not. An act intended to ensure the well-being of research animals does not hold investigators accountable for their animal research actions and perpetuates elitist attitudes toward certain animals.

All animals used in research, including livestock, should come under the provisions of the Animal Welfare Act. We are noting a desire to replace "act" animals with livestock because, in the words of a Harvard University memo, and I quote, "The advantage of using sheep and pigs is that these animals do not come under USDA regulations." Remember, these are regulations that merely oversee the care and handling of certain animals prior to and after the research experience.

Presently, actual research is exempt from the provisions of the act. We feel this exemption must be stricken from the statute. The intent is not to interfere with research, legitimate research, but rather to institute a mechanism for monitoring and accountability. We have repeatedly experienced difficulty in meeting with investigators and securing information about various experiments which have been brought to our attention. We feel we are a moderate and responsible organization, but yet we have been dismayed by the arrogance and the aloof attitudes displayed by some researchers.

A mandated Animal Care Committee with at least two public representatives that is responsible for all phases of the animal stay in the research facility seems necessary. This would provide a central point in each facility where protocols, records, and veterinary medical programs for all animals would be on file and available for review by USDA personnel and other enforcement officers, and as well by the general public. Such a committee being familiar with the research rationale because they would have approved and evaluated the original proposal would be able to initially answer questions pertaining to the research, the use of the animals, and the care of the animals.

Standards should be promulgated, not on minimum or existence needs, but rather on creating and insuring a humane, comfortable, and stimulating environment to the animal's mind as well as the body.

Quickly, other areas of concern are a prohibition on multiple uses, a cleaner and clearer definition of pain, an expanded role for veterinarians, and the requirement that standards must be met before a research facility is registered.

Because of these observations we are strongly endorsing H.R. 4406. If animals must be used in research endeavors it is society's obligation to guarantee they are always wisely and respectfully treated. H.R. 4406 begins to meet this obligation.

We do caution the subcommittee that the Animal Welfare Act is only as good as its level of enforcement permits. Together with strengthening the act is the absolute need to dramatically increase the level of funding for the training of personnel, numbers of personnel, and other areas directly relating to the enforcement of the act. We have heard expressions from various research facility employees during discussions on H.R. 4406 that they are not particularly concerned about the ramifications of this bill because they rarely are visited by the USDA. And in fact this has been borne out by our review of various inspection forms which, in some cases research labs have not been visited in the last year and a half, and in many cases they had violations of the act and no one has gone back to see if those things have been resolved.

Our suggestions and the amendments in H.R. 4406 are not new or revolutionary approaches to this issue. Precedents and variations can readily be found in a number of European countries. For example, in Denmark, "the use of vertebrates for biological research * * * which may be assumed to be linked with * * * suffering for the animals may only take place with the permission of the animal experiments committee." Norway has a similar experimental animal board. A researcher in England must have a sponsor and obtain a license before beginning research. Norway requires an application stating the purpose, nature, size, and duration of the studies. Qualifications of the applying scientist and staff are also examined. In Switzerland, managers of research laboratories are jointly held responsible with the researcher that the tests are kept to a minimum and do not involve pain. The Netherlands, Italy, Finland, and Luxembourg also require permits or licenses to conduct research on animals.

Sweden has instituted ethical committees which include lay people to assess proposed experiments. All have a federal ministry, such as the USDA, to coordinate these laws and activities.

In conclusion, we thank you and members of the committee for holding these important hearings, and we offer our aid and our experiences to this subcommittee, the research community, regulatory agencies, and other interested parties in bringing about an effective change and improvement for laboratory animals.

Thank you.

Mr. Walgren. Thank you very much.

The next witness is Dr. Jay Glass, from Pittsburgh, Pa.

Welcome, Dr. Glass. We are particularly pleased you are here, and please proceed.

STATEMENT OF DR. JAY GLASS

Dr. Glass. Thank you, Mr. Chairman.

I am on the faculty of the University of Pittsburgh School of Medicine, hold doctorates in neurobiology and psychology, and have published over 40 papers in the neurological and behavioral sciences. My comments represent my own views and may or may not match the attitude of the University of Pittsburgh.

You see, Mr. Chairman, we human beings are very fortunate. We live in a world designed by and for our own species. At a very early age we are taught a language and the social skills required in order to care for ourselves, acquire food and shelter, and to more or less make the world conform to our needs. However, the animals are clearly not so fortunate. They find themselves, through no choice of their own, living in a world for which they possess few of the skills needed to allow them to adjust to their environment or to make their environment adjust to them. They do not even possess the human safety-valve of suicide to stop intolerable physical or emotional pain.

The animals' evolutionary history has designed them to survive in their natural environments. If not, they would have been selected out and not allowed to live in a world for which they are not prepared. On the great plains of Africa, for example, the lion and the antelope, each in their own way, have evolved the skills needed to make them survivors. The scientific research laboratory, however, was not a part of any animal's evolutionary background. Their chromosomes do not contain programs for coping with a world of electric shocks, spinal cord transections, and being assaulted with the severe physiological and behavioral stresses of the scientific laboratory. It is for these reasons that we humans bear a special responsibility toward the animals which we forcibly remove from their natural environment and place in a totally foreign world.

As a research scientist for the past 15 years I have gone through my hundreds if not thousands of rats and cats. I felt a great sense of personal responsibility toward these animals. To the best of my abilities I have insured that they were free of pain and unreasonable discomfort from their birth to their death.

The issue I now wish to address is that this humane care has been my personal choice. If I had chosen otherwise I would have been free to do with these animals pretty much whatever I wished. There is very little governance of what I could have done to these animals.

Scientists, you see, are people with normal everyday concerns. Our houses need new roofs, kids must be sent to college, we have the same social and professional aspirations as everyone else. Giving attention to the animal's well-being often entails more complex experiments, more time given to finishing any one project, as well as added expense. It is very tempting to view the animal as just another laboratory instrument. It is most often simply more expedient to ignore the welfare of the animal and to push on cranking out the data.

I have no interest in naming names or making accusations of abuse. However, I would like to briefly describe a situation I have personally witnessed in order to emphasize the independence of the investigator in the treatment of research animals. In one type of experiment, frequently performed in the neurosciences, animals are given a curare-like drug that paralyses them. Even the potential to flee and to cry out has now been removed from the animal's coping responses. Surgical and experimental procedures are then performed on the animal. Local anesthetics may be given, but there is no way to monitor their effectiveness in reducing pain since the animal is paralyzed. The most insidious aspect of this method is that since the animal is paralyzed the experimenter does not have to come face to face with the animal's agony.

In a laboratory in which I worked I saw a postdoctoral student, while the senior man was using the telephone, sneak into the lab and give a paralyzed cat a general anesthetic to relieve its suffering. Only the conscience of the individual governed that animal's treatment. I would like to point out that section 8 of the Schroeder amendments, H.R. 4406, would go a long way toward outlawing this paralysis procedure.

In another case cats had their spinal cords transected, they had neither feeling nor voluntary movement in the lower half of their body. These animals were then placed in standard cat cages with wire mesh bottoms. The animals could move their front legs, but their torso and hind limbs would simply drag along as dead weight. Feces and urine could no longer be excreted into the litter box. As a result of their hindquarters being dragged around, the wire mesh would rub away the hair, finally laying open their lower legs. The cats and their cages became an unspeakable mess.

The point of my giving this description that is probably a violation of existing law and certainly a violation of the Schroeder amendments is that it does happen, and no one outside of that particular lab knows that it happened. The paralyzation method and others of equal horror are commonplace in laboratories across the country. The individual researcher, be it a student or full professor, functions with complete freedom to treat their animals however they see fit. The animal, of course, has no recourse. Upon whose shoulders then is the responsibility for insuring humane treatment of research animals placed?

The answer is the most beleaguered person at a research institution, the veterinarian. The vet's primary job is to keep up a constant supply of cats, dogs, monkeys, et cetera, for the scientists. The M.D. or Ph. D. superstars are breathing down his neck daily to keep the supply of animals coming. He has little time to monitor how these animals are actually used. In the hierarchy of a medical school the vet is low man on the totem pole. To challenge a faculty scientist bringing in $1 million in research funds would most probably cost the vet his job.

In section 8 of the Schroeder amendment it explicity states that "Each proposed project involving the use of animals in a research facility in a manner that could cause pain shall be reviewed by the animal care committee." Clearly, such a committee is only as good as the consciences of its members.

However, such legislation is a start. One must simply hope that at least one person on the committee will not be intimidated by the power relationships amongst members of the committee and will actually match the experiments against the provisions of the Animal Welfare Act and make the effort to insure they are followed.

We humans built and designed the world in which we live. The animals, however, have been forced into this world, in particular the research lab. Technically, in the most advanced form of the human environment, one in which even most humans could not cope, the animal is totally and utterly helpless.

Therefore, we must accept responsibility as their stewards, to put in place governing procedures to insure against their abuse in any form.

I, therefore, urge the passage of H.R. 4406.

And if I may just add one or two additional comments, I think what you have heard here in these hearings is certainly not a worse-case scenario but the types of animal housing facilities and type of procedures that are commonplace across the country. And the sad thing is that with a little more time and a little more effort the same experiments could be performed using alternative techniques but certainly much more humane techniques, and the march of science against human disease will still be able to go forward.

Thank you.

Mr. **Walgren**. Thank you very much, Dr. Glass.

And finally on this panel Dr. Michael Giannelli representing the Fund for Animals.

Dr. Giannelli.

STATEMENT OF DR. MICHAEL A. GIANNELLI

Dr. **Giannelli**. Thank you, Mr. Chairman.

My name is Dr. Michael A. Giannelli, and I very much appreciate this opportunity to speak as the science adviser to the Fund for Animals. I was a medical service specialist in the U.S. Air Force, a respiratory therapist, and received a Ph. D. in clinical psychology from UCLA. Our specific legislative recommendations supporting H.R. 556 and H.R. 4406 are discussed in a separate paper submitted for your consideration. We are not opposed to all animal research, but to those experiments which spend billions of our tax dollars to produce pain, disease and stress in healthy animals. We are not demanding that revolutionary changes be made overnight, but we recognize that the time has come for the present system to begin fundamental reforms to make it more advanced and humane. As a psychologist I suggest that the really fundamental issue here is not animal behavior but rather human behavior toward other animals. I also believe that the most important alternatives in this context are alternative attitudes.

During my undergraduate training at UCLA. I was taught about the work of animal researchers such as Pavlov, Thorndike, Harlow, Skinner, and others. However, it should be noted that the ethics of such work was never once discussed by my professors. Furthermore, at no time in my graduate-level studies or clinical internships was animal research ever formally discussed. This should not be seen as an oversight in my training but rather it reflects the glaring lack of practical importance animal experiments have in the making of a psychotherapist. It is a common but definitely erroneous assumption that animal research has been a critically needed element in the understanding of human behavior. Of course, animal experiments in psychology have contributed an enormous amount of information. We have learned a great deal about how primates, dogs, cats, pigs, pigeons, rodents, et cetera, behave in highly artificial and stressful situations. But the practical importance and relevance to people of most of this information is highly questionable. As a doctor of psychology I believe that psychological research with animals is a particularly clear illustration of how animal research has become an end in itself, a self-perpetuating, self-monitoring, and self-congratulating industry. The results of most psychological animal research is particularly disconcerting in light of the low percentage of studies which ever even find their way into print.

The two major journals of the American Psychological Association which publish animal research reject approximately 64 percent of the manuscripts sent to them for publication. Despite this, there is so much animal and human research going on that the sheer volume of professional work which is published is far beyond the ability of anyone to intelligently assimilate. For example, UCLA alone carries over 800 psychology journals and over 7,000 biomedical journals.

Psychology has often been accused, unfortunately but I think fairly, of fostering some of the most painful and misguided animal experiments. It is not that the scientists are sadistic, but rather that the present system results in great suffering. In my opinion, the practice of animal research in psychology has been enormously revealing of human nature, but not because the results of such work can be clearly applied from so-called animal models to man. The researcher at work has shown that otherwise compassionate human beings are capable of truly remarkable detachment from and rationalization for the suffering they bring upon animals. We have also learned that people of exceptional intelligence and imagination can be engaged in the most eccentric investigations while apparently convincing themselves that their work is necessary. Necessity has a way of expanding to fill the volume supported by available funding.

Scientists are usually not trained for or inclined to ethical thinking, and science itself, being neutral in such matters, cannot always be relied upon to supply reasonable ethical restraints on animal research. In my judgment the inherent callousness of most current animal research has also had unfortunate psychological and intellectual consequences for people, for the researchers themselves, for generations of students encouraged to trade emphathy for inquiry, and for humanity as a whole. Science has produced such technical marvels that most of us have forgotten that scientific progress is not necessarily human progress.

I urge you not to be misled into thinking that the critical choice before you is the welfare of animals versus the welfare of people. Scientific research to improve human health and expand our knowledge is, of course, a highly desirable and humanitarian goal. But scientists should not be exempted from ordinary standards of decency and mercy toward animals. When this violation occurs, as it does at present, human knowledge may expand, but only at the expense of human character.

In conclusion, passage of H.R. 556 and a strengthened version of H.R. 4406 would be significant steps toward developing reliable scientific alternatives to much animal research and in making the present system more humane.

That completes my testimony, Mr. Chairman. However, I am submitting several pieces of written material which I would like to be considered for inclusion into the record.

Thank you.

[The prepared statement of Dr. Giannelli follows:]

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U.S. HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
REP. DOUGLAS WALGREN, CHAIRMAN
HONORABLE SUBCOMMITTEE MEMBERS

Documentation Supporting Testimony on Laboratory Animals - Oct. 14, 1981

There is a growing body of professional opinion which contends that animal research (which uses behaviorism as its predominant methodology) has failed to contribute significant knowledge relevant to the psychotherapy of people. Furthermore, behavioristic psychology has often been cited as perhaps the worst area of scientifically oriented animal abuse. Examples of such authoritative opinion are presented below:

> "Behaviorism has had a full and fair chance over more than half a century to show its worth; it has failed." (M. Brewster Smith, recent President of the American Psychological Association; Humanism and Behaviorism in Psychology: Theory and Practice. Journal of Humanistic Psychology. 18(1), Winter, 1978, pg. 367).
>
> "Why has it been so difficult to be scientific about human behavior? Why have methods that have been so prodigiously successful almost everywhere else failed so ignominiously in this one field?" (B.F. Skinner, the leading advocate of behaviorism; The Steep and Thorny Way to a Science of Behavior. American Psychologist: 30 (2), 1975, page 42).

"The second argument is that animal interests may be disregarded for the advancement of knowledge, or in the interests of science. This position is frequently cited in psychology texts presumably because it is sometimes difficult to point specifically to immediate benefits accruing to humanity from much psychological research with animals." (Alan D. Bowd, Ph.D., Ethical Reservations About Psychological Research with Animals, The Psychological Record, 1980, 30, page 206).

"What we think is remarkable here is the extent to which the very large body of behavioral work on animals has not had any major clinical payoff ..." (Robert Drewett, Ph.D., et al., Animal Experimentation in the Behavioral Sciences; In D. Sperlinger (Ed.); Animals in Research: New Perspectives in Animal Experimentation, 1981, page 183).

"Many of the authors center their work on what is clearly a psychological concept but are careful not to claim that their findings apply to humankind, or to say that their findings do not apply to humankind." (Don Bannister, Ph.D., The Fallacy of Animal Experimentation in Psychology. In D. Sperlinger (Ed.); Ibid).

"I hope that the evidence I have adduced shows that the cost is often too high in terms of the meager knowledge gained, its rare relevance to mankind ..." (Alice Heim, Ph.D., The Use of Animals in Experimental Psychology. Speech given to the International Association Against Painful Experiments on Animals, West Berlin, 1979).

"Can we justify cruel experiments on animals on the grounds that psychologists can learn more about behavior? I do not believe that any of the suffering I have caused to laboratory animals... has helped humanity in the slightest." (Richard Ryder, Ph.D., Sunday Mirror, London, February 24, 1974).

"Virtually the whole field of behavioral psychology is open to the sort of criticism we are advancing and it is correlatively no accident that far and away the worst atrocities upon animals occur in this field." (Bernard E. Rollin, Ph.D., Definition of the Concept of "Humane Treatment" in Relation to Food and Laboratory Animals. International Journal for the Study of Animal Problems, 1 (4), 1980, page 238).

"Ethical questions relating to research with animals have received only scant or passing attention... In view of the predominant role of non-human experimentation in psychology, and especially in consideration of the nature of much of that experimentation, this is a serious omission." (Alan D. Bowd, Ph.D., Ibid).

"It has probably not escaped your attention that in the spate of publications and symposia of the past few years on ethics and animals, psychology is often singled out for criticism." (Kenneth J. Shapiro, Ph.D., Diplomate in Clinical Psychology, Bates College, Lewiston, Maine; personal correspondence, February 23, 1981).

(regarding behaviorism): "There is no malice in it. In fact, its most characteristic feature is the absence of ideology and moral judgement. It is a collection of perfectly decent professionals and administrators hustling their tenures, spending their money by the end of the fiscal year, and being unconcerned with the consequences of their collective behavior." (M. Dumont, Ph.D., Letter; Social Science vs. Privacy. Journal of Humanistic Psychology, 16 (3), Summer, 1976, page 81).

"The researcher's central dilemma exists in an especially acute form in psychology: either the animal is not like us, in which case there is no reason for performing the experiment; or else the animal is like us, in which case we ought not to perform an experiment on the animal which would be considered outrageous if performed on one of us." (Peter Singer, Ph.D., Animal Liberation, 1975, page 49).

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October 1981

U.S. House of Representatives
Subcommittee on Science, Research and Technology
Rep. Douglas Walgren, Chairman
Honorable Subcommittee Members

LEGISLATIVE RECOMMENDATIONS RE: LABORATORY ANIMALS

Distinguished Congressmen:

We strongly urge you to pass H.R. 556, the Research Modernization Act. Animal researchers claim that they must use live animals because they have no alternatives. We suggest you give them the alternatives by supporting this legislation, which for the first time will put reasonable amounts of money into the development of more modern and humane research.

We also support H.R. 4406 with certain important qualifications. At least one-third of the membership of the "Animal Care Committee" (which would make all the critical decisions) should be composed of practicing veterinarians who are not part of any institutional research team and who are not selected by the investigators or the institutions doing the research, and representatives from humane organizations. An affirmative vote of at least 90% of the Animal Care Committee should be required before permitting painful research. Likewise, before pain relieving medications can be withheld, the Animal Care Committee must approve this by at least 90%, and a written record of such deliberations must be readily accessible to interested outside parties.

H.R. 4406 should be amended to assure that any failure of compliance with its provisions which leads to the suffering of animals will automatically result in the confiscation or euthanasia of those animals.

Most respectfully,

Dr. Michael A. Giannelli

Dr. Michael A. Giannelli
Science Advisor

SOME ALTERNATIVES TO THE USE OF HIGHLY EVOLVED ANIMALS IN RESEARCH AND TESTING

DR. MICHAEL A. GIANNELLI, SCIENCE ADVISOR
THE FUND FOR ANIMALS

TISSUE CULTURES

Cell Cultures: Single cells from human or animal tissues are grown outside the body. Substances to be tested for toxicity, irritancy, etc., can be applied to cell cultures and evaluated.

Organ Cultures: Groups of cells from a single organ are cultured. Since those cells have a functional relationship to each other, reactions can be tested with results similar to those in an intact body. Organ segments retain many of the properties of the intact organ.

BACTERIA CULTURES AND PROTOZAN STUDIES

Many species of bacteria react in the same way to toxins, mutagens, and irritants as we do, and many have similar nutritional needs to ours. Protozoa have similar chemistry to man and therefore can be useful in nutritional research. These organisms reproduce extremely rapidly and are easily monitored through several generations. They are also easily standardized, controlled, stored, and maintained at a very low cost.

EGGS

Bird and reptile eggs and embryos are used to study normal fetal development and the effects of drugs on the fetus. Eggs are also used to culture viruses and vaccines.

RADIOIMMUNOASSAY

This consists of saturation analysis techniques using radioactive elements. Radioactive substances similar to those present in the body are used to analyze a wide range of materials. Radioimmunoassays greatly reduce the number of animals needed. One animal can provide antibodies for hundreds of radioimmunoassays.

GAS CHROMATOGRAPHY AND MASS SPECTROMETRY

These are techniques used in identifying drugs and chemical substances. Gas Chromatography separates solutions into their basic elements. Mass Spectrometry identifies those substances.

QUANTUM PHARMACOLOGY

This science utilizes quantum mechanics, an understanding of molecular structure, and computerization. Quantum pharmacology seeks an explanation of the behavior of drugs on the basis of molecular properties.

MATHEMATICAL AND COMPUTER MODELS

Mathematical models can be used to make direct predictions of the functions of human systems. Computers, by means of simulation, provide information that cannot be gained from experiments using living creatures Computer and mathematical models are based on the use of equations of varying degrees of complexity to represent biological phenomena, and the state of all the elements in the model can be examined at any point in time and their interactions resolved. Although unfamiliar to traditional researchers, computer models are highly accurate and their capabilities are increasing in complexity as the technology is developed.

MECHANICAL MODELS

Simple manikins can be used in car crash studies. More complex types are now in final experimental stages for use in anesthesiologist training and can provide reactions to 12 different drugs. A more diverse simulator has been created which includes a heart, circulatory system, lungs and respiratory system along with a means of testing responses to drugs and kidney functions.

CLINICAL AND EPIDEMIOLOGICAL SURVEYS

Clinical surveys use human volunteers, clinical case studies and autopsy reports. Much greater use of human volunteers, under safely controlled experimental conditions, would provide important and direct documentation concerning human health problems. Epidemiological surveys are based on clinical observations coupled with data on associated environmental factors to establish possible links between a particular environmental factor and an abnormal syndrome or disease.

PLACENTA The human placenta, which is usually discarded after the birth of a child, can be used for practicing techniques of microvascular surgery, and for testing toxic side effects of chemicals, drugs, and pollutants. It provides a medium far superior to animal tissues because it is human, and it is free.

GENETIC ENGINEERING Genetic engineering is now being used to provide insulin of a much purer variety than was heretofore produced using animals. Genetic engineered insulin will eliminate a great portion of the harmful effects suffered by approximately 20% of the users of conventionally produced animal origin insulin. In addition to insulin, growth hormone and interferon can be produced through genetic engineering.

LITERATURE RESEARCH Many present day experiments are repetitive of research already conducted because the researcher is not adequately familiar with the literature, or the question has not been formulated correctly, or because experimental details are only slightly modified from previous experiments. Better cataloguing and greater access to published results of previous work could eliminate many such experiments now being undertaken.

ALTERNATIVE SPECIES If living creatures are to be used for experimental purposes, researchers should strive to obtain their results using specimens of the lowest possible level, on the theory that far more abuse can be done to a dog than can be done to an amoeba. For example, using the blood of Horseshoe Crabs is more humane and also cheaper and faster than using the blood of rabbits to test for poisonous by-products of bacterial infections called endotoxins.

ELIIMINATE THE TEST For some experiments there is no need to consider the alternative techniques because the study is irrelevant to human problems and therefore need not be done in the first place. To cite but one example amound thousands: "Pup Cannibalism: One Aspect of Maternal Behavior in Golden Hamsters;" C. Day and B. Galef, Journal of Comparative and Physiological Psychology, 91 (5), 1977, pgs. 1179-1189. Showing how environmental factors influence the number of pups eaten by a mother hamster is cruel, trivial and obviously of no relevance to human conditions. So called "pure" knowledge, with no practical applications for humans, is of course theoretically desirable. However, in the life sciences, were the objects of investigation are alive, it would seem reasonable that educated curiosity must be tempered by a particularly acute sense of responsibility toward experimental subjects, be they human or any other animal.

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Partial Survey of Reported Side-Effects From Some Drugs Developed Through Animal Research

The development of therapeutic drugs is one of the most widely used selling points of animal research. As the following survey suggests, such drugs can be highly dangerous and present problems worse than the ones they are designed to treat. This list is very incomplete and you are encouraged to read the source books listed at the end of this paper.

> "Drug activity in animals is no assurance of similar activity in humans, and for some human disorders there is no similar disorder in animals. Frequently, animal studies prove little or nothing and are very difficult or impossible to correlate to humans."
> Congressional Testimony (1962): American Medical Assn.

> "If drugs were tested on people and less on animals they might be better and safer. Proper caution would have to be taken with human testing, but in the long run it could give increased security on the side-effects of drugs and increase the prospect of new and better drugs."
> Dr. Ulf S. Euler (1970 Nobel Laureate for Medicine)
> Yorkshire Evening Press, York, England, Sept. 20, 1973

> "Right now there is almost no rationale for deciding whether the mouse, the rat, the rabbit, the guinea pig, or the monkey is going to be the better model for effects on human behavior...The point I am trying to come down to is that it is simply not possible with all the animals in the world to go through new chemicals in the blind way that we have at the present time, and reach credible conclusions about the hazards to human health."
> Dr. Joshua Lederberg (Nobel Laureate and President of Rockefeller Univ.); Chemical and Engineering News, March 2, 1981

Some Reported Side-Effects of Drugs Most Commonly Used in Psychotherapy

Anti-alcoholism---(Antabuse): neuritis, skin eruptions, drowsiness, impotence, headache, psychotic reactions; if taken with alcohol: respiratory distress, cardiovascular collapse, heart arrhythmias, myocardial infarction, acute congestive heart failure, unconsciousness, convulsions, death.

Anti-Psychotics

Phenothiazines (thorazine, stelazine, prolixin, mellaril): drowsiness, dizziness, tachycardia, hypotension, motor restlessness, jaundice, fever, anemia, EKG changes, tardive dyskinesia, cerebral edema, constipation, nausea, eye changes, insomnia, muscular weakness, blurred vision, muscle spasms, liver damage, psuedoparkinsonism, restlessness, nightmares, hypertension, loss of appetite, vomiting, diarrhea, nasal stuffiness, inhibition of ejaculation, weight gain, urinary problems, etc.

Butyrophenones (haldol): neuromuscular reactions, psuedoparkinsonism, tardive dyskinesia, muscle spasms, insomnia, restlessness, anxiety, depression, confusion, seizures, tachycardia, hypotension, anemia, liver damage, skin reactions, gastrointestinal disorders, bronchospasm, etc.

Thiothixenes (navane): tachycardia, hypotension, dizziness, EKG changes, drowsiness, agitation, insomnia, seizures, cerebral edema, psuedoparkinsonism, tardive dyskinesia, allergic reactions, etc.

Anti-Depressants

Tricyclics (sinequan, elavil, tofranil, norpramin, vivactil): dry mouth, blurred vision, constipation, urinary retention, drowsiness, confusion, disorientation, hallucinations, numbness, seizures, hypotension, tachycardia, skin rash, nausea, vomiting, indigestion, diarrhea, myocardial infarction, heart arrhythmias, stroke, delusions, anxiety, nightmares, numbness, incoordination, blurred vision, urinary retention, photosensitization, anorexia, black tongue, liver dysfunction, testicle swelling, blood sugar changes, altered EEG, fever, bone marrow depression, jaundice, itching, exaccerbation of psychosis, etc.

Monoamine Oxidase Inhibitors (parnate): increased anxiety, agitation, mania, restlessness, drowsiness, diarrhea, abdominal pain, constipation, tachycardia, edema, blurred vision, chills, impotence, heart palpitations, headaches, etc.

Anti-Manic (lithium carbonate): hand tremor, thirst, nausea, diarrhea, vomiting, drowsiness, muscular weakness, giddiness, blurred vision, ringing in ears, twitching, blackout spells, incontinence of urine or feces, stupor, coma, psychomotor retardation, circulatory collapse, thinning hair, dehydration, weight changes, goiter, EEG changes, EKG changes, swelling, etc.

Anti-Anxiety

Benzodiazepines (valium, librium, serax): drowsiness, depression, fatigue, headache, nausea, skin rash, slurred speech, anxiety, hallucinations, dizziness, rage, sleep disturbances, liver damage, constipation, ataxia, confusion, edema, libido changes, EEG changes, tachycardia, blurred vision, etc.

Hydrazines (*atarax*, *vistaril*): dizziness, weakness, hypotension, headache, nausea, vomiting, rash, drowsiness, dry mouth, motor restlessness, etc.

Meprobamate (*equanil*): drowsiness, ataxia, slurred speech, weakness, blurred vision, excitement, EEG changes, nausea, vomiting, diarrhea, heart palpitations, hypotension, allergic reactions, dizziness, headache, vertigo, tachycardia, etc.

Hypnotics (*dalmane*): dizziness, staggering, falling, lethargy, disorientation, coma, headache, heartburn, upset stomach, nervousness, irritability, chest pain, joint pain, blurred vision, shortness of breath, rash, burning eyes, hypotension, hallucinations, etc.

Stimulants (*amphetamines*, *ritalin*): cardiovascular changes, hypertension, nervousness, insomnia, rash, fever, anorexia, nausea, dizziness, heart palpitations, headache, blood pressure and pulse changes, tachycardia, chest pain, heart arrhythmias, abdominal pain, toxic psychosis, anemia, etc.

Anti-Cholinergics (*artane*, *cogentin*, *benadryl*): dryness of mouth, blurred vision, dizziness, nausea, nervousness, rash, delusions, hallucinations, constipation, drowsiness, urinary retention, tachycardia, vomiting, loss of appetite, finger numbness, listlessness, depression, double vision, nasal stuffiness, anemia, anaphylactic shock, tightness of chest, wheezing, thickening of bronchial secretions, weakness of hands, etc.

Over the years there have been a large number of drugs which were shown to be "safe" through animal testing but which were later found to have damaging effects on humans. Some examples of these are:

Thalidomide: caused more than 10,000 deformed babies
Cyclamates: suspected of causing cancer
Saccharin: suspected of causing cancer
Stilbestrol: caused cancer in young women
Swine Flu: caused paralysis and deaths
Paracetamol: hospitalized 1,500 in Great Britain
Orabilex: caused sometimes fatal kidney damage
MEL/29: caused cataracts
Metaqualone: caused psychic disturbance and 366 deaths
Chloromycetin: caused leukemia and aplastic anemia; often fatal
Isoproterenol: caused thousands of deaths to asthma patients
Flamenil: caused loss of consciousness
Eraldin: caused damage to eyes and GI tract; 18 deaths

Many other examples of this sort can be found in the following references and suggested reading list:

Physicians' Desk Reference, 31st Ed., Medical Economics Co.: Oradell, N.J., 1977

The Great Drug Deception, Dr. Ralph Adam Fine, Stein & Day: N.Y., 1972

White Magicians, Kurt Bluchel, Bertesmann: Munich, Germany, 1974

Time Magazine, article by Dr. Walter Modell, May 26, 1961

Confessions of a Medical Heretic, Dr. Robert S. Mendelsohn, Warner Books: N.Y., N.Y., 1979

Slaughter of the Innocent, Hans Ruesch, Bantam Books: N.Y., N.Y., 1978

Medical Nemesis, Ival Illich, Bantam Books, N.Y., N.Y., 1976

The Fund for Animals
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North Hollywood, California 91601

Telephone
(213) 985-5986

Michael A. Giannelli, Ph.D.
Science Advisor
October, 1981

Partial Survey of Medical Advances NOT Due to Animal Research

Animal researchers usually convey the impression that virtually no medical advances would have been possible without laboratory animals. This is far from true. The following list (which could be extended greatly) indicates that many of the basic tools of modern medicine had little or nothing to do with animal research. Indeed, if the following advances were taken away, modern medicine would have relatively little to work with.

Discoveries and Techniques:

thermometer: Galileo Galilei (1564-1642); in 1592

microscope: Anton Van Leeuwenhock (1632-1725)

stethescope: René Laënnec in 1855

x-rays: Wilhelm Röntgen in 1895

opthalmoscope: (to view the inner eye)

sphygmomanometer: (blood pressure cuff)

cardiac catheter: Forssman (1929)

percussion: (tapping the chest) Leopold Auenbruger (1722-1809)

pulse count: John Floyer (1649-1734)

auscultation: (listening to body sounds) known to the ancients

hypodermic syringe: (for injecting medications)

knee-jerk reflex: Marshall Hall (1790-1855)

cauterization: (controlled burn on tissues) known since the Middle Ages

blood types (ABO): Karl Landsteiner (1900)

antibiotics: Penicillin (toxic to guinea pigs); was discovered by Alexander Flemming (1929). Along with later antibiotics (streptomycin, chloramphenicol, and tetracycline), penicillin was extracted from molds and fungi.

anesthetics: Acupuncture has been used by the Chinese since ancient times. Ether was known in some form since the Middle Ages and its first use during surgery is credited to William Morton in 1846. As early as 1800 Sir Humprey Davy suggested that nitrous oxide could be used for anesthesia. Chloroform had been known since 1828 but its toxic effect in dogs retarded its distribution so that it was not until 1847 that it was first used during surgery by James Simpson. Lumbar anesthesia had been developed in 1899 by August Bier.

germ theory: Lazzaro Spallanzani (1729-1799) showed that no new germs arise in a sealed, heated jar. Louis Pasteur (1822-1895) studied the fermentation of wine and beer and also clarified the time and temperature needed to kill germs. Other work by Phillip Semmelweis and Antoine Bechamp contributed to knowledge of bacteriology.

aseptic technique: Joseph Lister (1827-1912) developed carbolic acid to kill germs which revolutionized surgical practice.

aspirin: Felix Hoffman (1900); causes birth defects in mice

iron: used for anemia therapy in ancient China

opium: used for pain in ancient China

morphine: Friedrich Serturner (1803); while morphine calms humans it causes excitement in cats

digitalis: William Withering (1785)

curare: used by South American natives

quinine: used by South American natives; isolated in 1820 and used for malaria by Sir Ronald Ross (1857-1932)

iodine: Louis Velpeau (1795-1867); in 1829

vitamin C: Sir Gilbert Blane (1784) used lime juice (fatal to some animals) to prevent scurvy.

mercury: used to treat syphilis in ancient China

radium: Madam and Pierre Curie (1898)

Included in this list would be many modern biomedical techniques: cell cultures, organ cultures, bacterial cultures and protozoan studies, egg cultures, radioimmunoassay, gas chromatography and mass spectometry, quantum pharacology, mathematical models, computer models, mechanical models, clinical and epidemiological surveys, placenta analysis, genetic engineering, etc.

Historical overview:

Many useful medical procedures were known to ancient civilizations (China India, Greece, Rome, etc.). The Greek Hippocrates (c460-c378 BC), the "father of medicine," did no animal research but was knowledgeable in the overwhelming importance of *diet*, *hygiene*, *sanitation*, *rest* and *exercise* in overall health. He used surgery and drugs sparingly, believing that the physician's role was to help nature do the healing. Another Greek, Galen (c130-c200 AD) added valuable knowledge from clinical experience with human beings but promulgated considerable erroneous information based on his research with animals. Much Hippocratic wisdom was disregarded and Galenistic dogmatism dominated medicine for 1400 years. The progress of medicine was thus greatly impeded. The great medical historians (e.g., Henry Sigerist, Rene Dubos, Brian Inglis, M. Beddow Bayley, Ivan Illich) agree that the disappearance of the disastrous plagues of the Middle Ages (e.g., bubonic, leprosy) was due to the reintroduction of hygiene and not to medical intervention.

Willard Gaylin, M.D., President of the Hastings Institute in New York stated the following in a recent television documentary ('Hard Choices"): "One of the ironies of the demand for more and better health care is that it comes at the same time as the widening realization that medicine has at best a limited impact on health. Doctors have long known that their role is minor compared to societal and environmental factors...According to a major study...seven common sense rules were discovered to be crucial to good health: regular exercise, eating breakfast, not eating between meals, not smoking cigarettes, keeping a normal weight, no heavy drinking, and sleeping seven to eight hours a night...The researchers went so far as to conclude that an improvement in our life styles will have a much greater effect in extending our longevity than have all the medical advances from 1900 to the present."

References and Suggested Reading:

Milestones of Medicine, Ruth Fox, Random House: N.Y., N.Y., 1950

The Story of Medicine, Petros De Baz, M.D., Philosophical Library, Inc.: N.Y., N.Y., 1975

Slaughter of the Innocent, Hans Ruesch, Bantam Books: N.Y., N.Y., 1978

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Oct, 1981

To Whom It May Concern,

Attached you will find a listing of Films on Laboratory Animals selected from several current audio-visual catalogs. You are encouraged to contact these sources directly to obtain these materials as supplements to the brief laboratory animal file produced by the Fund for Animals.

Most Sincerely,

Dr. Michael A. Giannelli

Dr. Michael A. Giannelli
Science Advisor, the Fund for Animals

MG:pvo

FILMS ON LABORATORY ANIMALS

ource: Educational Film Locator
ublisher: R.R. Bowker Co.
1180 Avenue of the Americas
New York, NY 10036

CATS

YNAMICS OF AN EXPERIMENTAL NEUROSIS: PART I — CONDITIONED FEEDING BEHAVIOR AND INDUCTION OF EXPERIMENTAL NEUROSES IN CATS

b&w 21 min si 16 mm

pparatus releases food pellets into animal's cage. Cat trained to respond to gnals by lifting lid of food box. Motivational conflict, induced by unpleasant last of air as animal is obtaining food, results in inhibitions, sensory yperaesthesia, phobias, motor disturbance, recurrent anxiety symptoms, and ther 'neurotic' patterns, both within and without experimental situation.

PSUPCR) 1944. (ISBN 0-699-08240-4)
nimals, Habits And Behavior Of—C; Psychology, Comparative—C
MnU PSt

YNAMICS OF AN EXPERIMENTAL NEUROSIS: PART II — EFFECTS OF ENVIRONMENTAL FRUSTRATIONS AND INTENSIFICATION OF CONFLICT IN NEUROTIC CATS

b&w 16 min si 16 mm

nvironmental frustrations compared with those produced by experimental onflict. Increased intensity of conflict (increased hunger drive) or constricting nimal by barriers differing in frustration value accentuates neurotic behavior. f animal resolves conflict or escapes from situation, many symptoms are lleviated.

PSUPCR) 1944. (ISBN 0-699-08241-2)
nimals, Habits And Behavior Of—C; Psychology, Comparative—C
MnU PSt

YNAMICS OF AN EXPERIMENTAL NEUROSIS: PART III — EXPERIMENTAL DIMINUTION OF NEUROTIC BEHAVIOR IN CATS

b&w 19 min si 16 mm

our therapeutic techniques' diminution of one of the conflicting drives (animal ed before being put in cage), reassurance and comforting while animal emains in problem situation, environmental pressure (animal with maximally einforced hunger drive is forced toward food), and social example (normal at, trained to feed at signal, is placed in cage with neurotic cat). The latter ethod proves least valuable.

PSUPCR) 1944. (ISBN 0-699-08242-0)
nimals, Habits And Behavior Of—C; Psychology, Comparative—C
MnU PSt

YNAMICS OF AN EXPERIMENTAL NEUROSIS: PART IV — ACTIVE PARTICIPATION IN ESTABLISHING MORE SATISFACTORY ADJUSTMENT

b&w 20 min si 16 mm

herapeutic technique of 'working through' conflict. Normal animals learn to ress switches for food, display varying degrees of frustration when thwarted, nd re-learn habit when barrier is removed. Neurotic animals avoid switch fter being frustrated and finally re-establish feeding pattern with self-signals. his trial and error activity is a 'working through' of conflict.

PSUPCR) 1944. (ISBN 0-699-08243-9)
nimals, Habits And Behavior Of—CG, Psychology, Comparative—CG
MnU PSt

FFECTS OF MORPHINE ON LEARNED ADAPTIVE BEHAVIOR AND EXPERIMENTAL NEUROSES IN CATS

b&w 17 min si 16 mm

ats trained to depress platform switch which activates feeding signal, then to queeze past barrier to feeding box. Morphine causes extinction of responses. fter three or four hours, learned behavior reappears. In 'neurotic' cats, orphine temporarily abolishes symptoms.

PSUPCR) 1942. (ISBN 0-699-08621-3)
harmacy And Pharmacology—CG, Psychology—CG, Psychology, omparative—CG
irector A. Wikler.
PSt

FFECTS OF ELECTROSHOCK THERAPY ON EXPERIMENTAL NEUROSES

b&w 29 min si 16 mm

ormal cats subjected to cerebral electroshock show impairment of learned esponse patterns. Cats made experimentally 'neurotic' by motivational onflicts (see **Dynamics of an Experimental Neurosis**), then subjected to lectroshock, show similar disorganization of complex inhibitions, compulsions, nd phobias, thus releasing more nearly 'normal' goal-directed behavior. lterations of conduct cannot be correlated with pathologic changes in brain.

PSUPCR) 1945. (ISBN 0-699-08615-9)
Animals—CG, Psychology—CG, Psychology, Comparative—CG
Director J. H. Masserman; Director M. G. Jacques.
PSt

EXPERIMENTAL MASOCHISM

b&w 10 min si 16 mm

Cats trained to depress switch which delivers air blast (or electric shock) followed by food. With moderate shock cats continue to operate switch while food is withheld. This self-punitive adjustment interpreted as involving 'masochistic' factors. If shock is excessive or food indefinitely withheld, behavior is extinguished or 'neuroses' develop.

(PSUPCR) 1946. (ISBN 0-699-09458-5)
Animals—CG; Psychology, Comparative—CG
PSt

DYNAMICS OF COMPETITION IN CATS: INTER-CAT RELATIONSHIPS IN A MANIPULATIVE FEEDING SITUATION

b&w 15 min si 16 mm

Cats who have been trained to manipulate switch which releases food pellets into their box are placed in experimental cage in pairs. Their manifestations of cooperation, conflict, dominance, and active and passive parasitism in this social food-getting situation parallel inter-human relationships.

(PSUPCR) 1944. (ISBN 0-699-08245-5)
Animals, Habits And Behavior Of—CG; Psychology, Comparative—CG
PSt

BEHAVIOR DISTURBANCES AFTER BILATERAL REMOVAL OF THE FRONTAL AREAS OF THE CORTEX IN CATS

b&w 16 min si 16 mm

In some cats entire frontal cortex was removed; in others, only cortex anterior to motor regions. Behavioral disturbances shown: abolishment of placing and hopping reactions, defects in posture and locomotion, mastication defects, compulsive pursuit behavior, general hyperactivity, and impairment in ability to acquire complex skill demonstrated in Acquisition of the Token-Reward Habit in the Cat.

(PSUPCR) 1938. (ISBN 0-699-02814-0)
Animals, Habits And Behavior Of—CG; Nervous System—CG; Psychology, Comparative—CG
PSt

ALCOHOL AS A PREVENTATIVE OF EXPERIMENTAL NEUROSES

b&w 19 min si 16 mm

Cats mildly intoxicated just before being subjected to motivational conflicts do not develop markedly neurotic deviations of behavior. However, if same conflicts are induced when animals are sober, severe inhibitions, compulsions, phobias, regressive patterns and other persistent neurotic aberrations are engendered. Analogy with man's use of alcohol to relieve anxiety.

(PSUPCR) 1945. (ISBN 0-699-00655-4)
Alcoholism—CG; Animals—CG, Psychology—CG; Psychology, Comparative—CG
PSt

DOMINANCE, NEUROSIS AND AGGRESSION IN CATS

b&w 30 min si 16 mm

Cats trained to compete for food form stable dominance hierarchy. Aggression appears when cat is displaced by more dominant animal or when it is made experimentally 'neurotic.' Goal-directed behavior deviates into aggression, mainly directed against animals who are higher in hierarchy. Amytal temporarily mitigates 'neurosis,' restores non-aggressive dominance system. Dynamic interrelationships of dominance, neurosis and aggression.

(PSUPCR) 1943. (ISBN 0-699-07914-4)
Animals, Habits And Behavior Of—CG; Psychology, Comparative—CG
Photographer J. H. Masserman; Photographer P. W. Siever.
PSt

EFFECTS OF VARIOUS DRUGS ON THE EMOTIONAL MIMETIC REACTIONS OF THE HYPOTHALAMUS AND CEREBRAL CORTEX OF THE CAT

b&w 20 min si 16 mm

Faradic stimulation of hypothalamus and sigmoid cortex accomplished through implanted needle electrodes. Effects of various drugs observed during separate or simultaneous stimulation; alcohol, dilute alcohol, metrazol, morphine, and sodium amytal.

(PSUPCR) 1940. (ISBN 0-699-08624-8)
Pharmacy And Pharmacology—CG; Psychology, Comparative—CG
PSt

POSTOPERATIVE DISTURBANCES OF VISUALLY CONTROLLED BEHAVIOR IN THE CAT FOLLOWING COMPLETE BILATERAL REMOVAL OF THE VISUAL CORTEX

b&w 14 min si 16 mm

Cats deprived of visual projection areas show no impairment of pupillary reflexes, blinking, righting reactions, and optic pursuit movements. Cats lose visual placing reactions, and cannot descend from slightly elevated surface or avoid obstructions. They lose ability to discriminate brightness under conditions of light adaptation, but show ability to discriminate brightness under conditions of low illumination.

(PSUPCR) 1936. (ISBN 0-699-23467-0)
Animals—CG; Psychology, Comparative—CG
PSt

DOGS

FFECTS OF HEMIDECORTICATION IN THE DOG
b&w 11 min sd 16 mm
hows the principal effects of complete surgical removal of one hemisphere of he cerebral cortex. Changes in reflexes, hemidecorticate rigidity, rotating behavior, and hemianopsia are demonstrated. (Animal Physiology Series)
INFORM, IN AVC) 1947. (ISBN 0-699-08618-3)
sychology, Comparative—C; Zoology—C
InU PSt

EXPERIMENTAL 'NEUROSIS' IN A DOG
b&w 10 min si 16 mm
Chronic disturbance was produced in a dog by difficult differentiation of food signals. Anxiety state lasted for seven years. Marked changes in respiration, accompanied by penile erection, negativism, refusal of food, whining, and barking, seen as animal reacts in experimental situation. Drastic change of environment temporarily relieves symptoms. Comparison with stable animal.
(PSUPCR) 1939. (ISBN 0-699-09460-7)
Animals—CG; Psychology, Comparative—CG
PSt WaPS

MONKEYS

(PERIMENTAL NEUROSES IN MONKEYS
&w 19 min sd 16 mm
ing procedure much like that used with cats (see Dynamics of an xperimental Neurosis), monkeys are rendered 'neurotic' by feeding-fear onflicts. Symptoms include habit disintegration, aversions and phobias, ereotypes, passivity and dependence, defecation, autofellatio, homosexual ehavior, irritability, hostility, and somatic dysfunctions.
SUPCR) 1951. (ISBN 0-699-09459-3)
nimals—CG; Psychology, Comparative—CG
irector J. H. Masserman; Director C. Pechtel.
PSt

BRAIN STIMULATION IN THE MONKEY - TECHNIQUE AND RESULTS
color 19 min sd 16 mm
Materials and techniques used in construction of surface and depth electrodes and surgery for implantation. Responses to stimuli applied to various areas of the brain.
(PSUPCR) 1957. (ISBN 0-699-03660-7)
Nervous System—C; Primates—C; Psychology, Comparative—C
PSt

IRREGULARLY DELAYED EXPERIENTIAL CLOSURE IN THE RHESUS MONKEY
color 17 min sd 16 mm
aboratory apparatus and experimental procedure. Animals are trained to a imulus sequence that consists of a low brightness warning light, a 'bright-safe' ght and a 'bright-shock' light. A response during the 'bright-safe' period by ushing a lever produces a food reward and prevents a shock. Groups are ested under various conditions, some of which involve unpredictable variation the stimulus sequence. Effects on behavior of animals.
SUPCR) 1969. (ISBN 0-699-15320-4)
nimals, Habits And Behavior Of—C; Primates—C; Psychology, omparative—C
PSt

THE EFFECTS OF DELAYED AUDITORY FEEDBACK ON NORMAL AND DEVIANT RHESUS BEHAVIOR
color 18 min sd 16 mm
Effect on human subject when voice of individual reading a paragraph is fed back through earphones after quarter of a second's delay. Experiments on young rhesus monkeys (some maternally and socially deprived) who are conditioned to vocalize for fixed period in order to obtain food. Apprehension and anxiety displayed when they are subjected to delayed feedback.
(PSUPCR) 1969. (ISBN 0-699-08613-2)
Hearing—CG, Psychology, Comparative—CG
PSt

SOCIAL BEHAVIORS OF EXPERIMENTALLY MASCULINIZED FEMALE MONKEYS
color 11 min sd 16 mm
Discusses possible origins of behavioral sex differences. Behavioral and anatomical effects on rhesus monkey fetuses exposed to testosterone. Fetal physiology and early infant socialization are jointly implicated as mediators of early sex differences in rhesus.
(PSUPCR) 1977. (ISBN 0-699-27011-1)
Animals, Habits And Behavior Of—C; Physiology—C; Primates—C
PSt

OTHER SPECIES

EFFECTS OF DIRECT INTERRUPTED ELECTROSHOCK ON EXPERIMENTAL NEUROSES
b&w 19 min si 16 mm
Sixty-cycle electroshock therapy relieves experimental 'neurosis' but also produces disintegration of normal behavior (see Effects of Electroshock Therapy on Experimental Neuroses). Study investigates direct square-wave (Leduc) electroshock therapy in context of standard Masserman procedure (explained in Dynamics of an Experimental Neurosis.) Typical results: disintegration again of both 'neurotic' and adaptive behavior, but to less marked degree.
(PSUPCR) 1950. (ISBN 0-699-08614-0)
Animals—CG; Psychology—CG
PSt

/ **CONDITIONED REFLEXES IN SHEEP**
b&w 8 min si 16 mm
Reflex used is defense leg retraction to electric shock. Otherwise, experiment is typical exhibition of Pavlovian technique. Animal placed in experimental harness and taught to display response to 120-beat of metronome, but not to 50-beat.
(PSUPCR) 1928. (ISBN 0-699-06037-0)
Animals, Habits And Behavior Of—C; Nervous System—C; Psychology, Comparative—C
PSt

$$

Source: Files for Life Sciences / PCR: Films and Video in the Behavioral Sciences
Publisher: The Pennsylvania State Audio Visual Services
Special Services Building
Universit, Park, PA 16802
(814) 865-6314

Files for the Life Sciences (2nd Edition 1980)

lervous Systems in Animals (IU) 971 17 min. color **21602** $11.50
esponse of simple animal forms to stimuli nd examination of their nervous systems. pinal cord, spinal nerves, and parts of brain ointed out in dissected fetal pig. Comparison f frog, bird, cat, and human brains. Basic lements of neuron and pathway of nerve npulse during a reflex arc. From the Animal stems s

PIG

DOGS

Constitutional and Environmental Interactions in Rearing Four Breeds of Dogs (PSUPCR) 1962 19 min. color **PCR-2124K** rental $10.50 sale $190.00
Experiment in which inbred basenjis, Shetland sheepdogs, beagles, and wire-haired terriers are raised in either "indulged" or "disciplined" fashion following weaning at three weeks of age. Puppy is punished each time he eats from bowl of meat; then experimenter leaves room and notes time elapsed before puppy eats again. Lasting effects of early experience are unique for each breed.

Films and Video in the Behavioral Sciences (1981)

MONKEYS

Brain Stimulation in the Monkey: Techniques and Results (PSUPCR) 1957
9 min b&w **22685** rental $10 50 sale $140 00

Materials and technique used in construction of surface and depth electrodes and surgery for permanent implantation. Movements of monkey and simultaneous electrical activity of septal area motor cortex, and anterior and posterior hippocampus shown. Stimulation of anterior hippocampus produced automatisms and electrical afterdischarges affecting anterior and posterior hippocampus and septal area, but not motor cortex. Stimulation of motor cortex evokes motor and electrical seizures, first observable in motor area and later in hippocampus. Independence of motor cortex and hippocampus is demonstrated. (J. M. R. Delgado)

Brain Stimulation in the Monkey: Techniques and Results (PSUPCR) 1957
9 min col **22686** rental $13 00 sale $215 00

Color version of **22685.**

Physiological and Behavioral Effects of Noise (PSUPCR) 1975 8 min col **11498**
rental $9 00 sale $95 00

Rhesus monkeys are exposed to loud, man-made noises for periods of several hours. Behavioral and cortisol level changes are observed. On early exposure, monkeys are hyperactive and cortisol levels are elevated; after five hours, monkeys are lethargic and cortisol levels drop below pretest levels. (ref. Monkeys Agree — Noise Is Upsetting, *Primate Record* 4(1). 3-6. 1973). (P. Nealis . Dodsworth)

DOGS

† **Experimental Control of Hyperkinesia and Violence** (PSUPCR) 1974 33 min b&w
33039 rental $15 50 sale $290 00

Illustrates the interaction of central nervous system stimulants and psychosocial therapy in the modification of violent and hyperkinetic behavior in dogs. Individual differences in reactions of normal and naturally hyperkinetic dogs to amphetamines. Individual differences in amphetamine-induced anorexia and stereotopy. (S. Corson)

CATS

The Motivated Saccade (HSCC) 1974 26 min col **33078** rental $14 50

Documents motivated control of a specific brain wave. Labor[illegible]y experiment in which a cat is conditioned to increase or withhold its eye movement and the related lambda wave. Explains saccadic eye movements and summarizes the behavior in terms of presently understood brain mechanisms.

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Source: Medical Catalog of Selected Audiovisual Materials Produced by the United States Goverment / A Reference List of Audiovisual Materials Produced by the United States Government
Publisher: General Services Administration
National Archives and Records Service
National Audiovisual Center
Washington, DC 20409

Medical Catalog (1980)

EERS OF THE VERTICAL FRONTIER - AEROMEDICAL RESEARCH LABORATORY

MIN, 16MM FILM, OPT. SD, COL 1967

ODUCER USAF

TLE NO 004825/RA SALE

OWS THE TRAINING AND CARE OF PRIMATES. INTS OUT THEIR VITAL USE IN DECOMPRESSION D RADIATION STUDIES, BLOOD ANALYSIS, AND PERIMENTAL MEDICINE.

EVIOUSLY THIS HAS BEEN LISTED AS 'PIONEERS THE VERTICAL.'

EARED FOR TV. THIS IS CONSIDERED OF HISRICAL VALUE AND DOES NOT NECESSARILY RE-ECT CURRENT POLICY OR PLANS OF THE SPONRING AGENCY.

GERMFREE ANIMALS IN MEDICAL RESEARCH

10 MIN, 16MM FILM, OPT. SD, COL 1960

PRODUCER USPHS SPONSOR USNMAC

TITLE NO 001722/RA SALE

DEMONSTRATES THE USEFULNESS OF GERMFREE ANIMALS AS RESEARCH TOOLS. DESCRIBES EQUIPMENT NECESSARY TO CONDUCT GERMFREE INVESTIGATIONS.

Reference List (1978)

PLASTIC ISOLATORS - NEW TOOLS FOR MEDICAL RESEARCH
14 MIN, 16MM FILM, OPT. SD, COL 1954
PRODUCER USAMAC
TITLE NO 001348/RL *SALE*

DEMONSTRATES HOW INEXPENSIVE PLASTIC ISOLATORS WILL PROTECT LABORATORY ANIMALS FROM CONTAMINATION DURING RESEARCH STUDIES THESE ISOLATORS ARE ALSO BEING USED TO PROTECT PERSONNEL FROM VIRULENT ORGANISMS, NOXIOUS FUMES AND RADIOACTIVE DUSTS

ARTERIAL INJURY AT HIGH AND LOW VELOCITY
8 MIN, 16MM FILM, OPT. SD, COL 1973
PRODUCER USA
TITLE NO 005728/RL *SALE*

DOCUMENTS A SERIES OF EXPERIMENTS ON ANIMALS TO VISUALIZE THE BALLISTIC BEHAVIOR OF MISSILES IN TISSUE AND THE SEQUENCE OF DAMAGE CAUSED TO ARTERIES

Source: Index to Health and Safety Education
Publisher: National Information Center for Educational Media (NICEM)
University of Southern California
University Park
Los Angeles, CA 90007

NICEM Index, 4th Edition (1980)

48/5/15
0868304 MP
Sleeping Brain, The - An Experimental Approach
(From The Films At The Frontiers Of Psychological Inquiry Series.)
PRODUCER: HOUGHTON MIFFLIN CO (HMC)
ONE BEACON ST, BOSTON, MA 02107
DISTRIBUTOR: HOUGHTON MIFFLIN CO (HMC)
ONE BEACON ST, BOSTON, MA 02107
YEAR: 71 GRADES: H-C A ; 16MM FILM OPTICAL SOUND; 23 MIN
LIBRARY OF CONGRESS:72-702267 ; STOCK CODE: C

Presents De Michel Jouvet who explores neurophysiolog and neuropsychology of sleep and dreaming and demonstrates research methodology through a series of experiments on cats. Shows how electrodes are implanted to record REM, EOG and PGO activity and explains how animal research relates to studies of human behavior.

SUBJECT HEADINGS: Animal - General - Psychology; Animal - Comparative Psychology; Experimental - Sleep, Fatigue And Dreams; Methodology & Research Technology - General - Psychology; Methodology & Research Technology Psych Experiments-Observations; Physiological - Neurology

SUBJECT CODES: T005100 ; T005110 ; T211600 ; T700000 ; T701200 ; T743300

48/5/13
0869815 MP
Experiments On The Chick Embryo, Pt 2 - Grafting Limb Buds
(From The Developmental Biology Film Program Series.)
PRODUCER: EDUCATION DEVELOPMENT CENTER (EDC)
55 CHAPEL ST, NEWTON, MA 02160
DISTRIBUTOR: BFA EDUCATIONAL MEDIA (BFA)
2211 MICHIGAN AVE, P O BOX 1795, SANTA MONICA, CA 90404
YEAR: 72 GRADES: C ; 16MM FILM SILENT; 8 MIN
LIBRARY OF CONGRESS:72-702817 ; STOCK CODE: C

Shows experimental techniques for performing chorioallantoic, intracoelomic and flank grafts.

SUBJECT HEADINGS: Laboratory Techniques - General - Science; Biology, Cellular Biology; Biology, Zoology - General; Biology, Zoology - Birds

SUBJECT CODES: V455000 ; W070310 ; W070910 ; W070925

Source: National Library of Medicine Audiovisuals Catalog (through Avline computer retrieval service)

Publisher: U.S. Dep't. of Health and Human Services
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20209

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TI  - Recent developments in nuclear transplantations/N
TC  - . [Motion picture]
AS  - / Clement L. Markert ; produced by MDA TV Dept. of Medical
      Communication.
IM  - [Houston :@Univ. of Texas M. D. Anderson Hospital and Tumor
      Institute],@1974.
CO  - 1 reel, 41 min. : sd., col. ; 16 mm.
GN  - Audience level: ; --Medical: undergraduate; specialty graduate.
GN  - --Specialty: genetics. ; Rating: Highly recommended.
GN  - Review date: Nov. 1974.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
CA  - QH 442 VC no.1 1974004NLM
PC  - University of Texas M. D. Anderson Hospital and Tumor Institute,
      Houston.  Dept. of Medical Communications
PR  - Loan: 30.00 ; Sale: Write for complete information.
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - OSka ; COcnd ; MBJAR
DA  - 760109
LR  - 770403
UI  - 7600493A
AV  - 400068
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TI  - Alpha fetoprotein production by normal and malignant hepatocytes/N
TC  - . [Videorecording]
AS  -  / University of Texas System Cancer Center M. D. Anderson
      Hospital and Tumor Institute ; [produced by] MDA-TV.
IM  - Houston :@The Center : [for sale by its Dept. of Medical
      Communication],@1977.
CO  - 1 cassette, 53 min. : sd., col. ; 3/4 in.
SE  - Research seminar series//N
GN  - Credits: Stewart Sell.
CA  - WQ 210.5 VC no.2 1977004NLM
PC  - University of Texas System Cancer Center M. D. Anderson Hospital
      and Tumor Institute, Houston.  Dept. of Medical Communication
PR  - Sale: 36.50 (no. 700-1-77)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - OOmxh ; COaej
DA  - 781026
UI  - 7801664A
AV  - A02016
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TI  - The@Starling heart-lung procedure/N
TC  - . [Videorecording]
AS  -  / [Communications Office for Research and Teaching University of
      California Medical Center].
IM  - [San Francisco] :@The Center : [for sale by its Educational TV
      Division,@1968?]
CO  - 2 cassettes, 63 min. : sd., b&w ; 3/4 in.
GN  - Audience level: ; --Allied health: undergraduate.
GN  - --Dental: undergraduate. ; --Medical: undergraduate.
GN  - --Nursing: undergraduate.
GN  - --Specialty: physical medicine, cardiology. ; Rating: Recommended.
GN  - Review date: Nov. 1975.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support. ; Credits: Leslie L. Bennett.
CA  - WG 202 VC no.1 1968004NLM
PC  - University of California, San Francisco.  Educational TV Division
PR  - Loan: 35.00 ; Sale: 140.00
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - OOMLH ; COVSW ; MOECB
DA  - 771018
LR  - 790328
UI  - 7604246A
AV  - 454069
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TI  - Autonomic nervous system & asthma/N
TC  - . [Videorecording]
AS  - / Academy of Health Sciences.
IM  - Fort Sam Houston, Tex. :©The Academy,©1973.
CO  - 1 cassette, 38 min. : sd., col. ; 3/4 in.
CE  - U. S.  Army.  Medical Dept.    Continuing education program
       [Videorecording]//
GN  - Title varies slightly. ; Present concepts in internal medicine.
GN  - Available in various formats. ; Audience level:
GN  - --Medical: undergraduate; specialty graduate; specialty
       continuing education.
GN  - --Nursing: undergraduate; specialty graduate; specialty
       continuing education. ; --Specialty: pathology, physiology.
GN  - Rating: Highly recommended. ; Review date: Sept. 1974.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support. ; Credits: Warren Gold.
CA  - WL 600 VC no.3 1973004NLM
PC  - Academy of Health Sciences.  Health Sciences Media Division
PC  - American Association of Orthodontists
PR  - Loan: Free (no. CME No. 308)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - ODAEJ ; ODCND ; MDECB
DA  - 760109
MR  - 791202
LR  - 791220
UI  - 7600052A
AV  - 400008
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TI  - Life and death relationship : the heart and its blood supply/N
TI  - The@Heart and its blood supply [Motion picture]/
TC  - . Part I, Physiology. [Motion picture]
AS  - / U. S. Army.
IM  - Washington :©The Army ; [Atlanta : for loan by National Medical
       Audiovisual Center],©1966.
CO  - 1 reel, 28 min. : sd., col. ; 16 mm.
CE  - U. S.  Dept. of the Army.    PMF/5394/N
CE  - U. S.  Dept. of the Army.    PMF [Motion picture]/5394/
GN  - Available also in 3/4 in. videocassette. ; Audience level:
GN  - --Allied Health: undergraduate. ; --Dental: undergraduate.
GN  - --Nursing: undergraduate. ; --Specialty: physiology.
GN  - Rating: Recommended. ; Review date: Feb. 1974.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
CA  - WG 202 MP16 no.1 1966004NLM
PC  - National Medical Audiovisual Center ; NMAC-ILL ; NMAC-ILL(S)
PR  - Loan: Free (no. M-1638-X)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - ODKA ; COLRK ; MDMAC
DA  - 751207
LR  - 810611
UI  - 7500121A
AV  - 209139
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TI  - The@Nose and paranasal sinuses/N
TC  -  : an introduction to their anatomy, physiology and pathology.
       [Motion picture]
AS  - / W. G. Kobrak and G. E. Tremble.
IM  - New York :©Ayerst Laboratories ; [St. Petersburg, Fla : for loan
       by Modern Talking Picture Service, inc.,©1970]
CO  - 1 reel, 15 min. : sd., col. ; 16 mm.
GN  - Audience level: ; --Medical: undergraduate.
GN  - --Specialty: anatomy, gross, otorhinolaryngology.
GN  - Rating: Recommended. ; Review date: Aug. 1973.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
GN  - Aided by a grant from the Doho Chemical Corp.
CA  - WU 340 MP16 no.1 1970004NLM
PC  - Modern Talking Picture Service, inc.
PR  - Loan: Free
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - ODAJB ; COLRK ; MDECB
DA  - 751207
LR  - 810611
UI  - 7500148A
AV  - 400015
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TI  - Strangulated obstruction of the intestine/N
TC  - . [Motion picture]
AS  -  / Harold Laufman ; produced by Davis & Geck.
IM  - Danbury, Conn. :@Davis & Geck ; [Atlanta : for loan by National
      Medical Audiovisual Center,@1960?]
CO  - 1 reel, 22 min. : sd., col. ; 16 mm.
SE  - Cine clinic//N ; Cine clinic [Motion picture]//
GN  - Audience level:
GN  - --Medical: undergraduate; specialty graduate; specialty
      continuing education.
GN  - --Nursing: undergraduate; specialty graduate; specialty
      continuing education.
GN  - --Specialty: surgery, surgical nursing, physician's assistants.
GN  - Rating: Recommended. ; Review date: Oct. 1976.
GN  - Reviewer: National Medical Audiovisual Center (NMAC).
GN  - Learning method: Support.
CA  - WI 460 MP16 no.1 1960@04NLM
PC  - National Medical Audiovisual Center ; Davis & Geck.  Film Library
PR  - Loan: Free (no. M-2084-X) ; Loan: Davis & Geck, 10.00 (no. DG-865)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@aej ; C@ajb ; M@JAR
DA  - 770112
LR  - 770427
UI  - 7602263A
AV  - 455086
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TI  - The@Gliding mechanism of tendons/N
TC  - . [Motion picture]
AS  - / Dept. of Surgery, New York Hospital, Cornell Medical Center ;
      produced by Sturgis-Grant Productions.
IM  - New York :@The Hospital ; [Atlanta : for loan by National Medical
      Audiovisual Center,@1969]
CO  - 1 reel, 13 min. : sd., col. ; 16 mm.
GN  - Audience level: ; --Allied Health: undergraduate.
GN  - --Medical: undergraduate; specialty graduate; specialty
      continuing education.
GN  - --Nursing: undergraduate; specialty graduate.
GN  - --Specialty: physical medicine. ; Rating: Recommended.
GN  - Review date: May 1974.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support. ; Supported by the Martin Foundation.
GN  - Credits: James W. Smith, Herbert Conway.
CA  - WE 600 MP16 no.1 1969@04NLM
PC  - National Medical Audiovisual Center
PR  - Loan: Free (no. M-1770-X)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@AJB ; C@LRK ; M@ECB
DA  - 751207
LR  - 790920
UI  - 7500092A
AV  - 209056
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TI  - Cryosurgery in the oral cavity/N
TC  - . [Motion picture]
AS  - / Veterans Administration Dental Training Center.
IM  - Washington :@The Center ; [Atlanta : for loan by National Medical
      Audiovisual Center,@1967]
CO  - 1 reel, 14 min. : sd., col. ; 16 mm.
GN  - Audiance level:
GN  - --Dental: specialty graduate; specialty continuing education.
GN  - --Medical: specialty graduate; specialty continuing education.
GN  - --Specialty: oral surgery. ; Rating: Recommended.
GN  - Review date: Oct. 1974.
GN  - Reviewer: American Association of Dental Schools (AADS).
GN  - Learning method: Support. ; Credits: Andrew Gage, Fred Emmings.
CA  - WU 600 MP16 no.8 1967@04NLM
PC  - National Medical Audiovisual Center
PR  - Loan: Free (no. M-2886-X)
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@ka ; C@lrk ; M@JAR
DA  - 751207
LR  - 770127
UI  - 7500058A
AV  - 303972
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TI  - Neurophysiology demonstrations/N
TC  - . [Videorecording]
AS  -  / prepared by Robert S. Fisher & Philip A. Schwartzkroin ;
      produced & directed by the Division of Instructional Media,
      Stanford University.
IM  - Stanford:@The Division,@[1975]
CO  - 1 cassette, 40 min. : sd., col. ; 3/4 in.
GN  - Audience level: ; --Allied health: graduate.
GN  - --Medical: undergraduate; graduate.
GN  - --Specialty: neurology, neurophysiology, anatomy, neurosurgery.
GN  - --Nursing: graduate. ; Rating: Recommended.
GN  - Review date: Mar. 1977.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
CA  - WL 102 VC no.1 1975@04NLM
PC  - Stanford University.  School of Medicine.  Division of
      Instructional Media
PR  - Loan: 35.00 ; Sale: 75.00
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@ejh ; C@ajb ; M@JAR
DA  - 770510
LR  - 770602
UI  - 7602710A
AV  - 455052
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TI  - Introduction to neuromuscular pharmacology/N
TC  - . [Motion picture]
AS  -  / Theodore C. West.
IM  - Seattle :@Univ. of Washington Press,@[1967]
CO  - 1 reel, 6 min. : sd., col. ; 16 mm.
SE  - Self-teaching films in pharmacology ;/12/N
SE  - Self-teaching films in pharmacology [Motion picture] ;/12/
GN  - Also available in 8 mm. and super 8 mm. format. ; Audience level:
GN  - --Allied health: undergraduate. ; --Dental: undergraduate.
GN  - --Medical: undergraduate, specialty graduate.
GN  - --Nursing: undergraduate. ; --PhD: specialty graduate.
GN  - --Specialty: pharmacology, neurophysiology, physiology.
GN  - Rating: Recommended. ; Review date: June 1975.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
GN  - Supported by the National Fund for Medical Education.
CA  - QV 4 MP16 no.2 1967@04NLM ; [WL 102 MP16 no.3 1967]@0XNLM
PC  - University of Washington Press
PR  - Loan: Write for complete information
PR  - Sale: Write for complete information
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@rsg ; C@ajb ; M@POD ; M@AJB
DA  - 770302
LR  - 780418
UI  - 7602493A
AV  - 205202
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TI  - Motility responses in the small intestine of the rabbit/N
TC  - . [Motion picture]
AS  -  / Gordon W. Searle ... [et al.] ; produced by the Motion Picture
      Production Unit, University of Iowa.
IM  - Iowa City :@The University : [for loan and sale by its
      Audiovisual Center]@[1968]
CO  - 1 reel, 18 min. : sd., col. ; 16 mm.
GN  - Audience level: ; --PhD: specialty graduate.
GN  - --Specialty: physical medicine. ; Rating: Highly recommended.
GN  - Review date: July 1974.
GN  - Reviewer: Association of American Medical Colleges (AAMC).
GN  - Learning method: Support.
CA  - QL 863 MP16 no.1 1968@04NLM
PC  - University of Iowa.  Audiovisual Center
PR  - Sale: Write for complete information
EL  - F
IT  - MONOGRAPH
MT  - TITLE MAIN ENTRY
RO  - O@RSG ; C@AJB ; M@ECB
DA  - 770406
LR  - 790917
UI  - 7602651A
AV  - 400060
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Mr. **Walgren**. Thank you very much, Dr. Giannelli.
I notice that Dr. Fox had to leave and take a plane, and I am sorry for that, but we will be talking with him to try to complete the record with respect to his submission.

I wanted to ask one question, what went wrong with the USDA check on the Silver Spring laboratory? As I understand it, USDA had contact with the laboratory, made a report on the laboratory, had responsibility for ongoing contact with it, and yet nothing happened.

Yesterday the NIH took most of the responsibility, but the fact is that it was the USDA who had contact with that laboratory.

Could I ask, perhaps Mrs. Stevens, what went wrong there, from your point of view?

Mrs. **Stevens**. Well, first of all the inspector was not what I would consider a qualified person to be an inspector for laboratories. He does have a D.V.M. degree, however there has been minimal training by USDA. And furthermore for a purpose like this, as I testified, I believe the specialists who actually have an interest in small animals enhanced by their background, and who receive some additional training, are the ones who should be visiting laboratories. Administration of the law has been given a considerable test now since its enactment in 1966, and it is clear that the run-of-the-mill veterinary inspectors, who are primarily interested in livestock disease suppression, simply are not equipped to be effective inspectors of laboratories. So that is No. 1.

Second, there is a very bad system whereby the reporting has first to go out to the regional veterinarian, then back to the State veterinarian in charge, and, finally, to the central veterinary services in Hyattsville, who then make a recommendation. It goes round and round and round. And lots of times no one even signs off on the inspection reports which the veterinarian makes.

For example, in this case Dr. Perry did find deficiencies from time to time. Although, his findings were far from adequate, nevertheless, he did find some. But then he came back and said, oh, they are all taken care of. Those reports were not signed off by anyone. No one paid the slightest attention to the fact that deficiencies had frequently been found in this laboratory. There was nothing in the present system that flagged it.

So those are the main things, in my opinion: Not having the right people in the first place, not having enough training, and having what I consider a perfectly ridiculous system which is wasteful of time, money, energy, and simply does not get the act enforced.

Mr. **Walgren**. Other comments on that, with any specific knowledge?

Dr. **Giannelli**. I don't have specific knowledge to relate concerning the Silver Spring situation, Mr. Chairman, but just in general, in terms of the problems that USDA has in their inspection system.

I would read to you very briefly from their publication, Animal Welfare Enforcement, Fiscal Year 1980, quoting from page 5:

> Inspection, however, plummeted to near zero during the fourth quarter because officials determined that the inspection rate during the first nine months of the year could not be maintained without exceeding the appropriation for the year ($4.3

million). As a result only three staff members worked on animal care, and virtually no field work could be performed during the fourth quarter.

And then again on page 15, very briefly:

> During 1980, APHIS, [the Animal and Plant Health Inspection Service] launched a written information service directed specifically to licensees and registrants in part to supplement the declining number of personal visits made by inspectors.

They are, obviously, not funded adequately to do the job that they have been asked to do.

Mr. WALGREN. I see.

If you had one piece of the puzzle that we could put into place that would prevent the abuse of animals, setting aside the question of whether or not certain research should be done, where is the greatest gap in the system now? If you had one thing that you could add to how we monitor this system, what would that one thing be? We will go quickly because it is a very general question.

Dr. GIANNELLI. I would suggest that the peer review system and the in-house policing by the researchers themselves represents an insurmountable obstacle to reasonable reforms in the animal laboratory system. They simply need to have outside and objective inspectors, people who have more than recommendation power, but also have power to decide the fate of those animals, independently of the priorities of the researchers themselves and of the research institution doing the research.

Mr. WALGREN. We will pass down the line.

Ms. PAYTON. I have to agree that of all the proposals that we have suggested by far we endorse the animal care committees with public people on them, public representatives, so that we can begin to have access to find out what is going on in many cases with our tax dollars. So I also endorse animal care committees with public officials on them.

Dr. GLASS. Just a brief note. At lunch on Monday a technician from another lab in the medical center was talking how a certain monkey wasn't behaving right and he was going to torture that son of a blank and he was going to teach that blank a lesson by choking it until it sat still.

Now what I think this points out is that each person working with the animals can do whatever they please. There is no sense in their own minds that there is some governance or some policing or some legislation governing what it is they do with these animals. The individual investigator in his lab has complete freedom to do with the animals just as he sees fit.

And it is my view that that is the real breakdown in the system, that there really is virtually no accountability for what one does to one's own research animals.

Mrs. STEVENS. Mr. Chairman, if you want me to comment on it also, I would first endorse this very point. I think it is crystal clear that people who understand animal welfare must be brought into the system, and they should be people that also understand scientific work. That will do a great deal if they can be authorized to visit the laboratories, to have input on the institutional committees, site visit teams and in the Secretary's Advisory Committee under H.R. 4406.

Mr. BROWN [presiding]. Mr. Shamansky.

Mr. SHAMANSKY. Thank you, Mr. Chairman.

Dr. Glass, my question is directed to you because you stated that you chose voluntarily to follow certain standards with respect to humaneness. We heard yesterday, which is always the catch phrase, the key expression around here, cost effectiveness.

In your opinion, what additional cost was added to your experiments because of the humane treatment as distinguished from a lack of or a total absence of concern for that?

Dr. GLASS. In one sense my animals are housed in what are called colony cages. My cats don't live in small cages by themselves, and in that sense one large screened-in enclosure was far less costly than individual cages.

Now, in terms of other experimental procedures where my animals are treated differently than is typically done I'd say the cost is typically in time, and I would say perhaps 20 to 30 percent more time to get any one experiment done, because I went through these extra steps to, shall we say, habituate the animals to the procedure and to just take it easier on them and to induce less stress on them.

I would roughly estimate about 20—20 to 30 percent more time.

Mr. SHAMANSKY. That would be the major cost factor?

Dr. GLASS. Yes; mostly in time, not money. In fact——

Mr. SHAMANSKY. Except we have to translate time in terms of money.

Dr. GLASS. Right. I was thinking in terms of the expense of buying more laboratory equipment.

Mr. SHAMANSKY. So, would you hazard a guess that because of the fact that your animals are in better shape, you run through fewer animals.

Dr. GLASS. Yes; and, well, actually the main issue is that my animals have the experiments done on them when they are under no anesthetics, neither this paralysis preparation nor local anesthetics nor general anesthetics. My animals are sufficiently trained in a careful procedure such that they will hold still voluntarily for the experiment to proceed. And they are perfectly free to move around, to cry out, to run away and let me know—no; stop! Don't do this any more.

In terms of the experimental validity my animals are biologically purer than the animals upon whom various stresses are put as well as general anesthetics are given.

So, in a sense one can say that there is great, great benefit in taking the time and doing these experiments more carefully and with less stress and suffering on the animal.

Mr. SHAMANSKY. In the scientific literature: Is there much comment by critics of results obtained from experiments conducted in circumstances in which the care is absent, to therefore call into question the ultimate validity of the experiment?

Dr. GLASS. Yes; I believe one of the papers that Mrs. Stevens referred to, at the end of the paper the authors in a very loose, kind of casual way, talk about the effects of pain upon the animal's biological systems and how that might have interacted with the experiment involved.

Mr. SHAMANSKY. I mean, is there in science today a questioning of the general validity of experiments conducted under such circumstances?

Dr. GLASS. I would say no, not really.

Mr. SHAMANSKY. Any reason why not?

Dr. GLASS. Because, the alternative—if one introduces that into the equation then one has to face the fact and do something with it.

Mr. SHAMANSKY. Well, I am assuming that science, you know, proceeds fearlessly to its——

Dr. GLASS. No; scientists have to buy new cars, scientists have to put their children through college——

Mr. SHAMANSKY. Like Congressmen?

Dr. GLASS. Yes; scientists are interested in varied, the same sorts of things, and the issue is to turn out as many papers as possible and to try for a professional advancement.

Mr. SHAMANSKY. But there really is not a body of criticism within science calling into question this attitude and the results of experiments conducted under those circumstances?

Dr. GLASS. Why, I would have to say that it self-selects for people who don't have that attitude. If one has that attitude then early on in one's training, he would drop out.

Mr. SHAMANSKY. And that individual would go back to the National Academy of Sciences noting or commenting on this fact?

Dr. GLASS. Yes; I'd have to just say that I don't know that.

Mr. SHAMANSKY. Thank you, Mr. Chairman.

Mr. BROWN. Mr. Gregg.

Mr. GREGG. Thank you, Chairman Brown.

I, unfortunately, was not able to be here yesterday because I was in my home district. I had a chance to review some of the testimony, however, and like most people who are concerned about animal welfare, I would like to see something accomplished here that will have a positive effect on the treatment of the animals used in research. I am just wondering if this panel has further comments as to how the Schroeder bill can be expanded or improved upon in order to produce an even better bill.

Dr. GIANNELLI. The specific recommendations of the Fund for Animals concerning H.R. 556 and H.R. 4406 are submitted separately, but I think one of the critical revisions of 4406 as currently written has to do with the consequences to researchers and to research institutions of violations of the provisions of H.R. 4406 which lead to the suffering of animals.

As currently written, H.R. 4406 includes a clause which, unfortunately, is a gaping loophole. H.R. 4406 would require that when a research facility is found to be in violation of any of the provisions of the act which result in the suffering of animals, the Secretary is authorized to confiscate and/or humanely destroy those animals. But then there is the loophole which says the Secretary may act unless the researchers in the research institution state that they need those animals for the current experiments, tests, et cetera, and I am afraid under that circumstance the enforcement would be nonexistent because the researchers would be foolish to indicate that they do not need an animal for the research in which they had been accused of violating acts of the provision.

So, I would suggest that that language must be greatly strengthened, perhaps even to the point where a violation of any of the provisions leading to suffering of animals would result in an automatic confiscation and/or euthanasia of those animals.

Mr. **Gregg**. Thank you.

Mrs. **Stevens**. I have some other suggestions as well which I will submit for the record, but to go over them quickly the first is that two members who shall be members of the public not connected with the institution, shall be selected for their interest and knowledge of animal welfare and care.

It shall be unlawful for any member of an animal care committee to disclose any secret or confidential information obtained as a result of being on the committee, and members shall sign any appropriate undertakings in this regard.

Further, an individual working at a registered research facility has the right to notify any appropriate authority of abuses in animal care. All personnel must be given written notification of their right to this procedure.

And there should be a provision whereby the person would not lose his chance for advancement if he notified authorities.

Finally, if local anesthetics are used the animal must be able to behaviorally demonstrate the presence of pain.

Paralytics may not be present.

Ms. **Payton**. We have several recommendations which were highlighted in our testimony and I will briefly go over them.

We ask that all animals be included under the provisions of the Animal Welfare Act and eliminate the exemption for livestock because of our experiences of the trend towards pigs and sheep and other types of animals to circumvent USDA regulations.

We have asked also that the animal care committees include outside people, public officials. We have had a continuing problem of trying to get information about what is going on, and we have been sent to various places, people have been in some cases polite and sometimes very nasty about how they have responded to us. Public officials, at least two, would be helpful in gaining information and accountability for what is happening.

We have asked for an expanded role for veterinarians. We have found that when we have asked consulting veterinarians with the USDA-registered facilities, in almost every case they are not familiar with the research but yet they are signing off on the research that it met the obligations of the act.

We find that there is various research that is going on without the benefit of a veterinarian.

And last, we have asked that the standards be met before a facility is registered. Currently, a research lab merely applies for its registration license and doesn't have to meet standards before it is registered. Other activities under the Animal Welfare Act are required to meet standards before they become registered or licensed.

Thank you.

Dr. **Glass**. If I may just add some emphasis to this last amendment addressed by Mrs. Stevens, that is the use of this paralysis procedure where the animal is given a paralytic drug such that its muscles don't work. It can't move, it can't cry out. And then the experiments are done on the animal.

I find this to be one of the most objectionable procedures that is used in the research lab and one which is perhaps borderline in terms of H.R. 4406, in terms of its legality, but I can see how one might make an argument even with 4406 in place and still go ahead and do these procedures. But the amendment described by Mrs. Stevens would go a long way to formally and officially outlawing this procedure.

Mr. **Gregg**. Mr. Chairman, would you yield me a couple more minutes?

Mr. **Walgren** [presiding]. Certainly.

Mr. **Gregg**. In terms of standards for registering technicians, what would you propose?

Ms. **Payton**. Standards to meet the Animal Welfare Act in terms of the housing, care, and handling of the animals.

Mr. **Gregg**. Well, is there any system by which you could put an affirmative obligation on the technicians or the veterinarians to report or to disclose activities which are perceived as violating the act?

Ms. **Payton**. I am not quite sure I understand what you are driving at.

Mrs. Stevens alluded to the fact that people could blow the whistle, but yet still be protected in their job, and they could not, it could not be held against them.

Presently, there is really no one that you can go to to report a problem, and we heard about that yesterday, that it is a lot of redtape, it is a lot of mumbo-jumbo, and it is very difficult to get action on a problem.

Mrs. **Stevens**. I think your suggestion is very good, and we would endorse it, that is to make it affirmative, make it obligatory for anyone who observes an abuse to report it to the proper authorities.

Mr. **Gregg**. Thank you.

Mr. **Walgren**. Thank you, Mr. Gregg.

Mr. Brown.

Mr. **Brown**. Let me just ask one question of Dr. Giannelli. It is a personal interest of mine, the study of psychology, involving trying to get the most out of individuals, and I am thinking of Washoe in this regard. Are there any such things as animal experiments which try to enhance the state of the capability of the animal and see if they can be made to perform in extraordinary ways as a result of their enhanced state?

Dr. **Giannelli**. Yes, sir, there are, and I think——

Mr. **Brown**. Other than race horses.

Dr. **Giannelli**. Yes, sir, there are.

I think it is a very important issue that you raise because I think the point has to be stressed that it is not animal research per se that is objectionable. It is the abuse of research animals.

For example, there is some very exciting work being done at present exploring the communication potential between human beings and great apes and dolphins.

I think there is some other very exciting work that is taking place, much of it sponsored by the group called the Latham Foundation, based in Alameda, Calif. They are exploring the potentials for what is becoming known as pet-facilitated therapy in which companion animals are used in various therapeutic settings, such as mental institutions, correctional facilities, with the mentally retarded, with the physically handicapped. I think that work is of exceptional merit.

There is also work, if I might just divert for a second from the psychology aspect, I think that there is much animal research which I can support, and I would give you as an example at U.C.L.A. there is something known as the pet cancer clinic to which veterinarians from the local area bring animals that have not responded to traditional cancer therapies. They are brought to this clinic and experimental treatments are then tried on these animals, with the hope not only that that specific animal may be helped, but also that other animals with similar problems may be helped and potentially down the line something may be learned of relevance to human cancer problems.

I think this kind of research is exciting. I think it is very good. I also think it is a very far cry from the predominant type of research which is taking place now in which previously healthy animals are deliberately exposed to pain, injury, disease, privation, and stress, in order to model various human pathological conditions.

Mr. **Brown**. I raise the point because a good deal of what we are trying to do here and what you and your various organizations are trying to do is to, as I think we used the term before, raise the level of consciousness of both the public and the various scientific groups, and I would think that giving some emphasis to the types of positive research that we are mentioning here might enhance that educational process a little bit.

Dr. **Giannelli**. I could not agree with you more.

Mr. **Brown**. Thank you.

Mr. **Walgren**. Thank you, Mr. Brown.

Mr. Skeen.

Mr. **Skeen**. No questions.

Mr. **Walgren**. The Chair would like to recognize Mr. Rheem for a question.

Mr. **Rheem**. I have a question for Nancy Payton from the Massachusetts SPCA. You mentioned in your testimony that you feel one of the remedies for the abuse of animals in research would be the addition of one or two members of the public on the animal care committees.

I want to quote to you just a little bit from a letter I received from a researcher in the field and then ask you to comment on this issue that he raises. It basically addresses the qualifications of the members of the public to assess research. He says:

> The appropriateness of the use of animals in experimentation has been emotionally argued and few lucid conclusions have been reached. Little is known about the pivotal role of animal experimentation in basic biomedical and medical research as well as the training of doctors, consequently society is largely ignorant of the consequences of curtailing biomedical research. This happens at a time when human health is considered a right rather than a privilege and when society demands the utmost in physician performance, drug testing before human use and disease prevention. Scientists and investigators have rarely taken the trouble to inform society about what animal use for research involves, thus they are directly implicated in the problems that presently confront all biomedical research.

The issue I think he raises, is that it is one thing for a member of the public to be able to assess whether an animal is being abused or not, and something else again to judge actual research. Animal abuse is less a subjective analysis for members of the public than would be the question of should the research be done at all or is it appropriate or necessary.

I wonder if you would comment on that.

Ms. PAYTON. I think it is very important and appropriate that there be public members on an animal care committee, and I don't think that one needs to be that familiar with biomedical research to ask questions. And sometimes some of the best questions can be asked by those people that are not directly involved in a particular activity.

And, therefore, I think it is a very important role that public people will serve, and I think that in the long run it will be very beneficial to the type of research and I think that it will remind the scientists the concerns of the public and the balances of using animal research, the actual use of the animal versus the ethical implications, the money implications, the humane implications.

I think that once again it is an example of a researcher protecting himself, and if it is legitimate research, if it is responsible research he shouldn't or she shouldn't object to a lay person, and it doesn't necessarily have to be a lay person, it is the public representatives on the committee to explain why they are doing it, the rationale for it.

Mr. RHEEM. Do you have any recommendations on how those lay people would be determined? Would it be up to the other members of the animal care committee? Should humane societies be involved? How would that work out?

Ms. PAYTON. Quite honestly, we as a humane society would prefer not to be on an animal care committee because of our role as advocates for animals as well as our law-enforcement powers, but we would suggest people we felt had in some cases expertise in the area but yet were sympathetic and aware of the humane concerns and the public's concerns.

I think it is a difficult set of guidelines to set up, who is going to be on it, but it is not impossible, and I think that is something that we sit down and work out with the USDA, scientists, representatives from the scientific community, and I think together we can come up with a responsible definition of who should serve on the animal care committee and not just the public officials.

I think we also have to look at the scientists and the veterinarians that are serving on it.

Mr. RHEEM. Thank you, Mr. Chairman.

Mr. WALGREN. Thank you, Mr. Rheem.

You know, it strikes me that one question is, what do we want this animal care committee to do? And particularly what do you want the public member to do? My instinct is there are probably various roles that could be defined, not the least of which would be simply to raise a warning flag to a more sophisticated inspection or judgment system.

Here the testimony is that USDA has something like seven experts.

Is that correct, Mrs. Stevens, for the Nation as a whole, and our problem is that these flags may not be raised. A warning flag may not be raised, and certainly a noninvolved person who is not in the position of vetoing research but is in the position of bringing attention and review to a particular circumstance could be very helpful.

Mr. WALGREN. The Chair recognizes Mr. Gregg.

Mr. GREGG. Mr. Chairman, I would just like to follow that up. I do not see how these committees are going to do anything unless there is some affirmative responsibility on them. They are in a passive position. There is no reason they should do anything, even if they include a public member. I think you should consider putting some affirmative obligation there.

Mr. WALGREN. My own reaction to the hearings thus far is that we could go a long way in actually working out specific affirmative obligations. Then people would strive to meet their obligations, in the knowledge that if they did not and a situation like the Silver Spring lab occurred they would be severely criticized.

Again, the idea to me is that maybe what we are trying to do is simply set up a system that raises good warning flags. Then people that the scientific community respect could come in and make the kinds of judgments that perhaps would be an improvement.

Well that is an aside and not really to this point.

Any other brief comments?

Dr. Glass.

Dr. GLASS. Yes, just one brief comment. It has sort of been a thread that I believe in the letter Mr. Rheem read, and I have heard other people sort of mention. This panel is not here to shut down scientific research. We are not proposing that all research with animals be stopped. I am all for scientific research. I described that. Dr. Giannelli described that. We are all for scientific research continuing.

We just would like to put in place some guidelines, some governance procedure to cut down on the abuses that do go on in the scientific research laboratory.

Mr. WALGREN. Thank you very much.

We appreciate your participation and look forward to talking to you about this subject.

Mr. WALGREN. Before the second panel comes up we would like to bring on and introduce Hon. Tom Lantos from California.

Congressman Lantos is particularly interested in this area. We very much appreciate your taking the time and having the interest to come and add something to the hearings.

And let me just say formally again that written statements will be made a part of the record. You are very welcome to proceed as you like. We are glad that you have come to spend some time with us and give us your views.

STATEMENT OF HON. TOM LANTOS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. LANTOS. Mr. Chairman, I want to thank you and the distinguished members of your committee for allowing me to testify.

I cannot help but comment on the dialog that just ensued because I think Dr. Glass very properly pointed out this phony dichotomy that those who favor scientific research and experimentation and those who care for animals are really in separate camps, and I do not think that is the case.

I also believe very strongly that there is a profound role for public participation. Just as wars are too important to leave to generals, so this issue is far too important to leave just to experts.

Mr. Chairman, it would be very easy to testify from a sense of moral outrage and I am strongly inclined to do so, but I shall resist that temptation. There is plenty of room for moral outrage in view of what has been unfolding over the years in the field of experimenting with animals.

The Nobel prizewinner, Isaac Bashevis Singer, says there is only one little step from killing animals to creating gas chambers a la Hitler and concentration camps a la Stalin.

I believe in this. Yet I shall resist the temptation to speak from a sense of moral outrage; rather I will try to deal with this issue in terms of the question of accountability for federally funded scientific work involving animals, because it seems to me that it is in this field that we as Members of Congress have a unique responsibility.

I would first like to deal with the question of care of animals. The intent of the Animal Welfare Act is to insure adequate care for animals. Given the evidence that animals are clearly not uniformly receiving adequate care we must ask if the Animal Welfare Act needs to be strengthened or we need to find strategies for better enforcement, or both.

It seems to me that this is both a humane issue and a scientific issue. Recent studies have clearly shown that stress induced by inadequate handling and care affects metabolic and endocrinological paramaters and consequently may seriously skew research findings.

It is difficult at best to extrapolate findings from animals to humans. It is more suspect when stress-induced variables are involved. What we are getting for our research money may or may not be accurate.

Allow me, Mr. Chairman, just to deal with one specific issue of testing. The problem here, it seems to me, is best exemplified by the LD50 test for toxicity. This test, as all of us in this room know, tells us what dose of a given substance will kill 50 percent of the affected animals in 2 weeks. This may be useful information for someone who wants to kill 50 percent of a given animal population, but it is not particularly useful information about the effects on humans of prolonged exposure to low doses of a given substance which is what we want to know.

Yet the LD50 test is widely used to test the toxicity of drugs, chemicals, pesticides, insecticides, food additives, and household substances. What we are getting for our money, Mr. Chairman, is not what we need to know.

I would like to say a word about research, both basic and applied. The problem here, clearly, is research design, what is intended, and research methodology, how it is done. We do not need to blind cats, which is precisely what we did in a major quarter million dollar study to learn about how physical disability affects the sexual performance of humans. We do not need to use repeated electroshock on animals to see that pain produces aggression.

A well known scientist in this field, Dr. Roger Ulrich, who had worked for years on pain-produced aggression recently repudiated his work in a letter to the American Psychological Association Monitor. I would like to quote very briefly from what he said:

> When I finished my dissertation on pain-produced aggression my mother asked me what it was about. When I told her she replied, "Well, we knew that. Dad always cautioned us to stay away from animals in pain because they are more likely to attack." Today I look back with love and respect on all my animal friends who submitted to years of torture so that, like my mother, I can say, "Well, we knew that."

We do not need to spend research money to find out what we already know, nor do we need to spend money for poorly designed research that will not tell us what we do need to know. Such experiments create and sustain public disillusion with science in general.

The issue, Mr. Chairman, is not scientific freedom but scientific accountability. For any science project funded by public money we must ask about the social utility of the project. Scientists must be concerned about science, but those of us who are responsible for the wise use of public funds must be concerned about the social utility of what we pay for.

Economy is not our only concern. It is certainly not my dominant concern. There is a profound moral dimension to these matters. No one should be allowed to thoughtlessly harm or kill another being who feels. We must understand that in these hearings, Mr. Chairman, we are speaking on behalf of those who cannot speak for themselves.

In conclusion I would like to call attention to some encouraging signs. The School of Aerospace Medicine at Brooks Air Force Base in Texas has recently established a replacement animal model committee to serve as a clearing house and to encourage research scientists to consider the feasibility of alternative techniques so that we can reduce the numbers of lab animals used and lessen the distress and pain endured by animals during experimentation.

Occasionally one has the feeling in studying this issue that we are engaged in what the French call a dialog of the deaf ones, dialoguer *des* sourd. The scientists talk about their goals and those of us who are committed to animal welfare are concerned about pain and suffering to animals.

I think this dialog of the deaf ones needs to be opened up so we understand that what we are dealing with is not an antiscientific crusade, it is merely a rational approach of clearly defining what we need to do, the proper role of animals in our search, and an expression of compassion for beings who sense and feel.

This morning in the Washington Post on the Op-Ed page there is an outrageous article by one of our pontificating pundits who denounces the people who care about animals and establishes the phony dichotomy that those of us who deeply care about animals do not care about human sufferings. This is only a poor bill of health for the author of this article which I strongly urge be made part of this record as an indication of how profoundly people with apparent education misunderstand what is at stake.

In conclusion, Mr. Chairman, I would like to express my appreciation to my mentor in this field, Dr. Connie Kagan of my staff, professor at the University of Oklahoma.

Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you very much, Mr. Lantos.

Without objection, that article will be made a part of the record, and I certainly want to compliment you on your interest and your obvious deep feelings and sincerity in this area.

[The information follows:]

Washington Post, Oct. 14, 1981

William Raspberry

Saving Monkeys, Ignoring People

I've just been reading The Washington Post file on the monkeys, and I'm frankly fascinated.

A small group of animal lovers has been conducting a campaign, at considerable cost and personal risk, to rescue 17 monkeys from a Rockville research lab. They say the animals were being mistreated.

Understand: I admire the commitment, the sense of personal responsibility, the derring-do, of those in the forefront of the rescue effort. I'm just puzzled by their priorities.

There is, for instance, Alex Pacheco, the 23-year-old George Washington University student who infiltrated the Institute for Behavioral Research and whose description of what was happening to the monkeys there led to a raid by Montgomery County police.

Pacheco, who is affiliated with People for Ethical Treatment of Animals (PETA), said he had been influenced by the book, "Animal Liberation," to stop eating meat and start "doing what's best for the animals."

"Doing what's best" apparently came to include the gathering of photographic and other evidence of "cruelty" to the lab animals, a report to the authorities and even a rescue raid to free the animals from the authorities themselves, with monkeys being secretly transported to South Carolina.

It is all incredibly heroic. And yet I found myself wondering if this young man could be so profoundly influenced by reading "Animal Liberation," what might he have undertaken if he had read the Reagan-Stockman budget, or infiltrated school cafeterias featuring ketchup-as-vegetable in school lunches for low-income children.

The fund-raising efforts instituted by PETA, the enlistment of such big names as Cleveland Amory and Christine Stevens (wife of Kennedy Center chairman Roger Stevens), and the coordination among local and federal authorities, all had me wondering how many of the more important social programs might have been saved if the rest of us cared as much about people as this band cares about monkeys. They clearly care.

"I must tell you that after 12 years in the movement, my tears don't flow much anymore," actress Gretchen Wyler said of her involvement on behalf of the monkeys. "But I cried."

Does she cry, one wonders, at the loss of jobs and training opportunities for laid-off CETA workers? Do her tears flow for the old folks whose Social Security payments are still not out of jeopardy? Is anyone looking to infiltrate the courts to dramatize what happens to low-income citizens unable to protect their rights as a result of the slashing of the Neighborhood Legal Services Program? Is the death of the Community Services Administration—the end of the longstanding federal commitment to advocacy on behalf of the poor—less heart-wrenching than the plight of 17 monkeys?

Nor were those tears shed for the monkeys futile tears. The National Institutes of Health, as a direct result of the efforts of these committed activists, moved to cut off funding for the Rockville laboratory. Wouldn't it be encouraging if the federal government moved to cut off funding for federal contractors found guilty of discrimination? But the government, instead of cutting off funds, is cutting its efforts to end employment discrimination against minorities and women, virtually ending its affirmative action efforts. Is cruelty in the personnel office less heinous than cruelty in the research lab?

Curious priorities indeed. I am reminded of the attitude of the right-to life people—or rather the right-to birth people, since so many of them seem to lose interest in the children after they are born. If they cared about life, as opposed to seeing to it that women who indulge unwisely in sex are properly punished by carrying their pregnancies to term, wouldn't their programs include a commitment to birth control, infant nutrition, early childhood education, day care for children of working mothers and more effective schools?

Likewise with the animal lovers. Does not their concern for life extend to human beings? At least the case can be made that what appears to be animal cruelty—subjecting laboratory animals to various diseases, disabilities and discomforts—has a payoff in reducing human suffering.

Perhaps they do care about human beings. Perhaps they see their role as fighting on behalf of those—whether animals or preborn children—the rest of us seem to ignore.

Still, all this heroism on behalf of 17 monkeys, when the situation for millions of human beings is desperate and growing worse, strikes me as, well, inhuman.

Mr. WALGREN. Mr. Brown.

Mr. BROWN. No questions.

Mr. WALGREN. Well, with that let me again extend the thanks of the subcommittee for your contribution.

We have a vote on the floor at this point, and before starting the next panel we will recess for what I hope will be only 10 minutes.

[Recess.]

Mr. WALGREN. If the second panel would come forward and take their seats.

The second panel is made up of Elinor Peretsman from United Action for Animals, Henry Spira, representing the Coalition to Stop Draize Rabbit Blinding Tests, Dr. Andrew Rowan representing the Scientists Group for Reform of Animal Experimentation, and Dr. Donald Barnes representing the Animal Protection Insitute of America.

If those people will come forward I would like to invite Elinor Peretsman to start as soon as we are settled.

Please proceed.

Welcome.

STATEMENTS OF ELINOR PERETSMAN, UNITED ACTION FOR ANIMALS, INC.; HENRY SPIRA, COALITION TO STOP DRAIZE RABBIT BLINDING TESTS; DR. ANDREW ROWAN, SCIENTISTS GROUP FOR REFORM OF ANIMAL EXPERIMENTATION; AND DONALD BARNES, ANIMAL PROTECTION INSTITUTE OF AMERICA

STATEMENT OF ELINOR PERETSMAN

Ms. PERETSMAN. Thank you, Mr. Chairman.

I am Elinor Peretsman and I represent United Action for Animals, a membership humane society which speaks not only for its 15,000 members but also for about 1,500 local humane societies throughout the United States.

I appreciate the opportunity to appear before you to discuss the Research Modernization Act, H.R. 556, legislation which my organization strongly supports. We come to this proposal from the humane perspective. However, I would like to bring to your attention the fact that substantial benefits for the public health and important economies for both Government and private industry would follow from an increased Federal research effort in the development of methods of research and testing which do not use live animals. These are generally referred to as alternative methods.

I would like to begin by talking about testing. We realize that at present nonanimal tests are not available to replace all testing which utilizes live animals. And we certainly do not suggest that environmental substances, new drug products, foods and food additives should go on the market untested.

We foresee that the increased research effort made possible by this bill will provide for better and more accurate testing than i now possible and will also solve the ethical and moral problem of the use of animals in laboratories. Basic knowledge will be increased and important advances will be made possible in solving human health problems through the increased development and use of modern nonanimal-using testing methods.

These methods are by their nature faster and less expensive to perform, more precise in their measurements and thus more reproducible from laboratory to laboratory. The economies made possible by these shorter procedures will make the testing and regulatory process less onerous for both private industry and Government, and enable the development of more new, more effective products in shorter periods of time. This will provide benefits for both the producer and the consumer because shorter-term, less-expensive testing and research methods will reduce development costs and thus the cost of new products.

While animal tests are widely used, and have been for almost 100 years there is great scientific skepticism about their validity. May I quote two distinguished scientists on the subject of animal tests to illustrate the range of these doubts.

Dr. GioGori, former Deputy Director of the National Cancer Institute's division of cancer cause and prevention, wrote in the Wall Street Journal of July 21st of this year:

> Science is now beginning to realize that our ability to assess human cancer hazard from animal tests may not surpass that of ancient soothsayers examining the entrails of sacrificial animals. Animal data are specific only to their experiments, and generalizations lead only to paradox.

And Dr. Joshua Lederberg, President of Rockefeller University, has been quoted as saying,

> It is simply not possible with all the animals in the world to go through new chemicals in the blind way that we have at the present time, and reach creditable conclusions about the hazards to human health.

What both men are saying, it seems to me, is that we must find better ways to test and thereby protect ourselves from environmental and chemical hazards. We feel that the Research Modernization Act provides a vehicle for finding these better ways.

Let me examine some of the problems with animal tests. First, the enormous differences between man and test animals in life span, size, and metabolism make the extrapolation of test results from animal to man questionable. These test results have been subject to criticism and outright public ridicule as a reaction to the saccharin and nitrite findings. The public continues to demand these products, because despite the animal tests it does not believe that they are harmful.

A second problem with the use of animal tests is the variability of test results. In 1975 Procter & Gamble sought to determine what differences would result if five competent and well-regarded laboratories, in addition to its own, performed a toxicity test on rats. Comparing results they observed differences among the laboratories of two- and three-fold.

A third consideration is the sheer volume of animal test information. Because they have been performed for so many years there is extensive scientific literature on animal test results. Even though much of the literature indicates debatable and variable data there is a tendency to prefer the known, with all its imperfections, to the unknown or the little-known. However, as more and more scientific work is done using alternatives I believe that it will be found that the alternative tests will be more readily accepted by the scientific community. And because they are more susceptible to refinement of method and provide more quantitative results many of the weaknesses of the animal tests can be avoided.

And finally, regarding animal tests, I point to the widespread public revulsion to them. The outcry of last year over the continued use of the Draize tests, despite the fact that only a relatively few animals, estimated at about 12,000, are used in these tests. But this test is only one of many tests which seek to identify effects ranging from skin irritation to lethal doses.

It is in the area of testing of environmental substances, drug products, and foods and food additives where by far the greatest numbers of laboratory animals are used and where the potential is greatest for the substitution of short-term, alternative methods. Private industry and Federal research and regulatory agencies are already working on the development of short-term tests and using them, as Dr. Brusick mentioned yesterday. Increased Federal research efforts in developing more short-term tests would have wide applicability and will produce the much-needed, improved testing methods which will greatly benefit the public.

With regard to the training provisions of the bill, historically training grants of the NIH and other Federal agencies have been concerned largely with animal research. We would like to see more funds diverted to programs for training in the many techniques of alternative research and testing. This would serve not only to educate science students in new ways to perform research but would also enable working scientists to become familiar with these new techniques.

With reference to the duplication or replication of experiments using live animals our position is that no such experiment involving live animals should be funded if, in the judgment of the National Center, which would be established under H.R. 556, it does not offer substantial likelihood that new scientific knowledge would be gained.

This position is compatible with the NIH guidelines concerning the use of live animals which stipulates:

> The experiment should be * * * so designed that the anticipated results will justify its performance.

The Research Modernization Act also calls for the dissemination of information on alternatives. Because the concept of alternatives to live animals is generating a great deal of interest here and abroad, it is essential that the NIH disseminate information on nonanimal-using research and testing methods to the scientific community and to the public, as it now does with animal research.

The NIH has ample facilities to implement such a mission through its periodic publications which circulate throughout the world.

There has been a great deal of comment about the bill's provision for a 30- to 50-percent reprograming of animal research funds to alternative methods of research and testing. This might be seen to be a large sum. However, I would like to point out that a General Accounting Office report on the similar version of this bill in the 96th Congress stated that in 1978 the NIH spent about $190 million or 7 percent of the total NIH budget on research that did not involve the use of live animals.

And about that same time an NIH official pointed out that 60 percent of all biomedical research today involved the use of live animals.

Since the 30- to 50-percent figure refers to the animal-using budget we might extrapolate the 7 percent of the total budget to the 60-percent figure of the animal-using budget and come out with a figure of about 15 percent of the total NIH budget that was spent in 1978 on nonanimal-using research.

And since there has been a steady growth in this area I do not feel that the 30- to 50-percent funding goal is unreasonable at this time.

I appreciate the opportunity of addressing you.

Mr. WALGREN. Thank you very much.

[The prepared statement of Elinor Peretsman follows:]

OCT. 14 1981

STATEMENT OF ELINOR PERETSMAN
UNITED ACTION FOR ANIMALS, INC.
BEFORE THE SCIENCE, RESEARCH, AND TECHNOLOGY SUBCOMMITTEE OF THE HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY

Mr. Chairman and members of the Committee. I am Elinor Peretsman and I represent United Action for Animals, Inc., a membership humane society which speaks not only for its 15,000 members but also for about 1,500 local humane societies in cities and towns throughout the United States.

I appreciate the opportunity to appear before you to discuss the Research Modernization Act, H. R. 556, legislation which my organization strongly supports. We come to this proposal from the humane perspective. However, I would like to bring to your attention the fact that there are far broader advantages possible. Substantial benefits for the public health and important economies for both government and private industry would follow from an increased Federal research effort in the development of methods of research and testing which do not use live animals. These are generally referred to as alternative methods.

I would like to begin by talking about testing. We realize that at present non-animal tests are not available to replace all testing which utilizes live animals. And we certainly do not suggest that environmental substances, new drug products, foods and food additives should go on the market untested. We foresee that the increased research effort made possible by this bill will provide for better and more accurate testing than is now possible, and will also solve the ethical and moral problem of the use of animals in laboratories. run-on Basic knowledge will be increased, and important advances will be made possible in solving human health problems through the increased development and use of modern non-animal-using testing methods. These methods are by their nature faster and less expensive to perform, more precise in their measurements and thus more reproducible from laboratory to laboratory. The economies made possible by these shorter procedures will make the testing and regulatory process less onerous for both private industry and government, and enable the development of more new, more effective products in shorter periods of time. This will provide benefits for both the producer and the consumer because shorter-term, less expensive testing and research methods will reduce development costs and thus the cost of new products.

Anothter cost-related aspect of the problem of reliance upon animal tests in both government and industry is the shortage of personnel willing to perform the unpleasant animal tests. Congress has appropriated millions of dollars in past years to subsidize the training of toxicologists in order to attract people to that field - $6 million in 1977 alone. Stipends of up to $25,000 per year have been offered by the National Institute of Environmental Health Sciences as enticement to PhD's, MD's, and veterinarians to enter careers in environmental toxicology. The shortage of toxicologists, perhaps because of scientists' distaste for performing these unpleasant tests upon animals, is world-wide.

While animal tests are widely used, and have been for almost 100 years, there is great scientific skepticism about their validity. May I quote two distinguished scientists on the subject of animal tests to illustrate the range of these frequently experessed doubts.

Dr. Gio Gori, formerly Deputy Director of the National Cancer Institute's division of cancer cause and prevention, wrote in the Wall Street Journal of July 21, 1981: "Science is now beginning to realize that our ability to assess human cancer hazard from animal tests may not surpass that of ancient soothsayers examining the entrails of sacrificial animals. Animal data are specific only to their experiments, and generalizations lead only to paradox."

And Dr. Joshua Lederberg, President of Rockefeller University, has been quoted as saying, "It is simply not possible with all the animals in the world to go through new chemicals in the blind way that we have at the present time, and reach creditable conclusions about the hazards to human health."

What both men are saying, it seems to me, is that we must find better ways to test, and thereby to protect ourselves from environmental and chemical hazards. We feel that the Research Modernization Act provides a vehicle for finding these better ways.

Let me examine some of the problems with animal tests. First, the enormous differences between man and test animals in life span, size, and metabolism make the extrapolation of test results from animal to man questionable. They have been subject to criticism ranging from that of statistical treatment of data to outright public ridicule. We witnessed this public scorn in the reaction to the saccharin and nitrite findings, where each substance was considered to have caused cancer in laboratory animals. The public continued to demand those products because, despite the animal tests, it did not believe that the products were harmful.

In another instance, the Teratology Society, in testifying before another subcommittee of the Science and Technology Committee in 1975, stated that tests for birth defects cannot be extrapolated from one species to another.

A second problem with the use of animal tests is the variability of test results. In 1975 Proctor and Gamble sought to determine what differences would result if five competent and well regarded laboratories, in addition to its own, performed a toxicity test on rats. Comparing results, they observed differences among the laboratories of two- and three-fold. Another test, reported in 1971, by the Mellon Institute and the Esso Research and Engineering Company, sought to find whether identical procedures in tests using animals followed by different laboratories would give consistent results. 25 laboratories took part in an "Eye and Skin Irritation Test Program". The results showed such extreme variation that it was concluded that there was no benefit to be gained from standardizing the testing procedures. Further, the report said "The more varied approach to this [hazard testing], the sooner better techniques can be developed which might lead to more uniform results." This diminishes the argument that alternative methods must be as good as animal tests, since the animal tests are widely viewed as unreliable. The alternatives will prove themselves on their own scientific merits.

A third consideration is the sheer volume of animal test information. Because they have been performed, with very little change, for so many years, there is extensive scientific literature on animal test results. Even though much of the literature indicates debatable and variable data, there is a tendency to prefer the known, with all its imperfections, to the unknown or little-known. However, as more and more scientific work is done using alternatives, I believe that it will be found that the alternative tests will be more readily accepted by the scientific community. And because they are more susceptible to refinement of method, and provide more quantitative results, many of the weaknesses of the animal tests will be avoided.

And finally, regarding animal tests, I point to the widespread public revulsion to them. The public outcry of the last year over the continued use of the Draize tests, which demonstrates eye irritation of cosmetics and household products on live rabbits, generated much public comment, cosmetic industry response and Congressional activity, despite the fact that only a relatively few animals - estimated at about 12,000 - are used in these tests. Resolutions deploring the Draize test were introduced in both houses. But this test is only one of a great many tests which seek to identify effects ranging from internally-administered lethal doses to externally-applied skin irritation tests.

It is in the area of testing of environmental substances, drug products, and foods and food additives where by far the greatest numbers of laboratory animals are used, and where the potential is greatest for the substitution of short term, alternative methods. Private industry and Federal research and regulatory agencies are already working on the development of short-term tests, and using them, Dr. Bruce Ames' test for mutagens, which uses Salmonella bacteria, is probably the most widely recognized and used test of this kind. Increased Federal research efforts in developing more short-term tests would have wide applicability, and will produce the much needed improved testing methods which will greatly benefit the public.

Now I would like to turn from the subject of testing to that of research. In research as in testing, animal experimentation has a long history, so that today, biomedical research, like testing, also relies almost entirely upon laboratory animals. Although techniques have been developed for tissue and organ culture, until relatively recently these were not widely used nor indeed generally known in the research community. An example of this technique is the keeping of heart tissue alive in the laboratory. Not only do these heart cells continue to function metabolically, but they continue to beat, as they did when part of a living creature. We are seeing evidence that these advances in research methodology are becoming better known as more and more reports of such work appear in the scientific publications we monitor. The increase in this work is such that both animal and human tissues of many types are now obtainable from commercial sources.

We think that one of the reasons - perhaps the most important one - for the continued reliance on live animals in research lies in the present grant review mechanism, in which a grant proposal involving the use of live animals is likely to be reviewed by a scientist or scientists in the same or similar discipline. This arrangement virtually insures that live animals will be used in that research project even though an alternative technique might well produce more basic, fundamental information than could be obtained on the live animals. The problem seems to lie in a lack of information on alternative research techniques by both researchers and reviewers.

In this respect we look to the Advisory Committee called for in H. R. 556 to influence the traditional reliance on live animals in research. This advisory committee, made up of scientists qualified in the various areas of non-animal-using research and testing, will assist greatly in furthering knowledge concerning alternative methodology.

It has been the practice in naming advisory committees to government bodies to appoint so-called public representatives. We feel that this is inappropriate in this case. We would like to see the Advisory Committee perform a purely scientific function. It should not be distracted by differences of opinion with, for example, animal welfarists who do not have the necessary expertise on the committee. To be useful, the Advisory Committee must serve a purely scientific function of advising in alternative methodology.

This is not to say that the Advisory Committee should be isolated from the public. We feel sure that members of the public, including ourselves, could provide valuable input into the committee's deliberations. Our own files contain many thousands of documented accounts of research and testing techniques which do not involve the use of live animals. Many of these are of sufficient importance that they could profitably receive the attention of the Advisory Committee.

With regard to the training provisions of the bill, I have referred earlier in my statement to stipends available for training in the traditional animal-using methods. Historically, students, even in elementary and secondary schools, have been taught to view biomedical research solely as animal experimentation. Training grants of the NIH and other Federal agencies have been concerned largely with animal research. We would like to see more funds devoted to programs for training in the many techniques of alternative research and testing. This would serve not only to educate science students to new ways to perform research, but would also enable working scientists to become familiar with these new techniques.

With reference to the duplication or replication of experiments using live animals, our posiiton is that no such experiment involving live animals should be funded if, in the judgement of the National Center which would be established under H. R. 556, it does not offer substantial likelihood that new scientific knowledge will be gained.

We realize that in developing new alternative techniques duplication and replication are necessary. What we object to is duplication or replication of experiments on live animals. There exists a massive national and international literature on animal research. It has been performed over so many generations that today it seems virtually impossible to conduct an animal experiment that has not been previously performed.

Our opposition to the funding of further animal experiments which do not, in the opinion of the National Center, offer substantial likelihood of new scientific knowledge is not unreasonable. It is compatible with a National Institutes of Health guideline concerning the use of live animals, which stipulates: "The experiment should be based on knowledge of the disease or problem under study and so designed that the anticipated results will justify its performance."

This guideline has not had the hoped-for effect, becasue it is virtually impossible for grant application reviewers or study sections to know whether a research proposal involving live animals duplicates or replicates work that has been done before. The lack of an adequate data retrieval system has caused members of the scientific community to call for better retrieval methods so that researchers can readily ascertain what work has already been done. With present retrieval methods, only bibliographic information, or a brief abstract, can be easily obtained. It is essential that the technology be developed and made available so that researchers can have ready access to full texts. Today the search for full-text documents is an arduous and time-consuming one, but full information is essential to eliminate duplicative research. In addition to the problem of identifying duplicative research is the need to build up library sources on alternatives research. As a university library official wrote in Science in August, "With materials acquired principally in areas of immediate interest, libraries will lack the breadth to accomodate new or changing research directions."

Therefore, we feel that it is essential that additional funding be made available to libraries which provide the underpinings for scientific work.

There is no greater value in the use of information than preventing the repetition of research already done. The existence of an effective data retrieval system, including historical data, would be cost-effective from the standpoint of the public. Important savings in both animal lives and Federal expenditures could be made if the American taxpayer were relieved of the cost of supporting duplicative research. Federal support of biomedical research includes the responsibility of providing scientific data to the research community in a readily usable form.

An official of the National Bureau of Standards recently wrote in Science magazine: "The government must recognize that its commitment to supporting basic research...also implies a commitment to make the results available in a form that maximizes their utility."

To eliminate or minimize duplication of experiments on live animals as required under 556, the National Center would need to devote major funding to the retrieval of the relevant data. The cost will not be trivial, but the expenditure would be cost-effective, as I said earlier, because it would relieve the taxpayer of the burden of supporting duplicative research. At the same time, it will make the research which is funded more productive, and, from our perspective, will spare a great many laboratory animals.

The Research Modernization Act also calls for the dissemination of information on alternatives. Because the concept of alternatives to live animals is new and is generating a great deal of interest here and abroad, it is essential that the NIH disseminate information on non-animal-using research and testing methods to the national and international scientific community and to the public, as it now does with animal research. Such information also needs to be aimed at the highly specialized, ivory tower scientist who might never otherwise know of new research techniques. The NIH already has ample facilities to implement such a mission through its periodic publications to the scientific community which circulate throughout the world.

There has been a great deal of comment about the bill's provision for a 30% to 50% reprogramming of the animal research funds to alternative methods of research and testing. This might seem to be a large sum to be redirected. However, I would like to point out that a General Accounting Office report on the similar version of this bill in the 96th Congress stated that in 1978 the NIH spent about $190 million, or "7% of the total NIH research budget", on research that did not involve the use of live animals. At around the same time, an NIH official said in a speech that "about 60% of all biomedical research today involved the use of live animals."

One might think that this $190 million expenditure for alternatives would have reduced the use of laboratory animals substantially. However, in 1979, an NIH publication (#79-1431) reported that its Animal Resources Program "responds to the ever-increasing reliance upon animal models in contemporary biomedical research". Thus it can be seen that even the $190 million that NIH was spending for non-animal-using research in 1978 did not lessen the reliance on laboratory animals, but rather that this reliance continued to increase. Nevertheless, that $190 million was a step in the right direction, and must be greatly expanded, as provided for in H. R. 556, if the heavy reliance on laboratory animals is to diminish.

Using the figures quoted above, that in 1978 $190 million, or 7% of the total NIH research budget was spent on non-animal-using research, and further, that 60% of biomedical research involves the use of animals, then we can determine what percentage of the total animal-using research budget was spent on non-animal-using research. Because the 30% to 50% reprogramming figure in H. R. 556 refers only to the animal research expenditures, this is the pertinent figure. Thus, 7% of 60% of the total budget - the $190 million - is about 15% of the animal research portion of the budget. If in 1978 NIH was spending 15% of its animal research budget on non-animal-using methods, we can expect that steady growth in this area of research has continued from that time.

Further, many researchers do not like to use animals. As a result there is a great deal of interest in non-animal-using research and testing. Thus, the more such research is funded, and information disseminated about it, the more the field will grow. In light of these facts, I do not feel that a 30% to 50% funding goal is unreasonable.

I appreciate the opportunity of addressing you and will be glad to respond to any questions.

Mr. WALGREN. The next witness is Henry Spira, of the Coalition to Stop Draize Rabbit Blinding Tests.

Mr. Spira.

STATEMENT OF HENRY SPIRA

Mr. SPIRA. Mr. Chairman, I appreciate the opportunity to speak on such a crucial issue, and want to discuss specific affirmative actions that can be taken.

I think there has been an enormous increase in the awareness that animals have feelings and that therefore we have an obligation to take their interests into account. That animals are not mere lab tools.

But in parallel, there is also the increasing use of lab animals. In other words, all this rhetoric, all this consciousness raising, has not helped the animals, it has not done the lab animals any good at all.

It would be productive, I feel, to concern ourselves with issues raised by committee members yesterday: What is politically viable? And what can be done now?

I want to depart from my prepared testimony which will be part of the record in any case, to address myself to these issues.

What is politically viable? I just received a copy of the October 1981 M.D. Magazine which goes to 170,000 doctors. The cover story concerns the rights of animals. It is an 8-page article which connects good science and sensitivity.

Prior to that there was a special report of the Federation of American Scientists, sponsored by 39 Nobel prizewinners, devoted entirely to animal rights.

Nobel Prizewinner Joshua Lederberg was featured as the lead story in the Research Triangle News Weekly, The Leader, the title was "Nobel Laureate Hits Large-Scale Animal Testing".

I think that good science and respect for all life, go together. And we have seen that when it is visible, the public becomes outraged by what is being done to laboratory animals. I think we need to recognize that the issue of animal rights has moved from ridicule to dialog, and I think this committee can move it from dialog to action.

I think there are actions which can be taken right now to affect change. And I don't think it has to go through the ponderous legislative process. I would like to suggest some possibilites.

I think a productive focus could be the animal behavior experiments which have been discussed at these hearings and have been widely publicized.

As one example, we focused on the 20-year cat sex experiment at the American Museum of Natural History, which Representative Lantos so eloquently recounted earlier this morning. Our campaign exposed deliberate mutilation of cats and kittens to then observe their sexual performance. And the public perceived that the results would add nothing worth knowing to the sum total of our knowledge. The end result of all this suffering of lab animals of all this horrow, is the creation of more laboratory animal victims; but it does not raise the quality of anyone's life, it does not benefit the public in any way.

I think that this committee could request the Office of Technological Assessment to evalute the entire animal behavior field. This requires no legislation and no Federal funds. On the contrary, it will save tax moneys.

I think you could request the funding agencies to provide this committee with a status report evaluating all federally funded animal behavioral experiments to answer the question of how this research benefits the public.

And also to do a retrospective on animal behavior research. To evalute the applicability, if any, of animal behavior experiments. What has the public really gotten out of it? How does it raise the quality of our lives? And I think the mere fact that you will be requesting accountability, will change mind-sets.

Earlier you mentioned desensitization. I think desensitization is also relevant in the massive use of lab animals, 100 million animals a year. Lab animals are not used as a last resort, in areas involving life threatening situations, rather, they are considered mere cheap lab tools.

Dr. Harold Feinberg of the University of Illinois School of Basic Medicine uses dogs for cardiac surgery research. He anesthetizes the dogs and they never wake up. He assures himself that there is a need for this research in dealing with life-threatening situations. And he then works out a strategy so that the animal will suffer the least pain possible. He does not deal lightly with the pain of lab animals. Such an attitude within the research community would vastly and immediately reduce the number of laboratory animals used and the pain inflicted. Unfortunately, the Feinbergs today are all too rare.

I think another area in which this committee could be very effective is in requesting Secretary of Health and Human Services, Richard S. Schweiker to urge the National Toxicology Program to follow its mandate, which is to develop new testing methods.

And I think what is important is not just to develop new testing methods but to develop batteries of new methodologies to actually substitute nonanimal systems for animal systems. If you develop two parallel systems, an animal system and a nonanimal system, it really doesn't do the animals any good.

I also think that you could urge the National Institutes of Health to set up a committee similar to the Diabetes Committee which coordinates and promotes all research in all Federal agencies dealing with diabetes. Thus, there woud be created a coordinating body, a network clearinghouse, to promote alternative research; to reduce, wherever possible, the use of lab animals which does not generate any meaningful scientific information. Right now there is no place within the National Institutes of Health where a researcher can send a proposal for alternatives.

I think Health and Human Services should develop an aggressive policy to request proposals for alternatives, to organize workshops, newsletters, symposia, and seminars. There has to be a specific place within NIH, or within HHS, which coordinates and evaluates the replacement and reduction of animals in research and testing.

Representative Lantos just discussed the LD50 animal poisoning test. I think that the National Toxicology Program could be requested to report on the data which need to be generated to protect public health, and I don't think we need to know how much of every chemical kills 50 percent of the population.

Similarly with the Draize. We are challenging the Draize rabbit-blinding test. In this test, chemicals are placed in the eyes of conscious rabbits to see the amount of damage done. It was only after we spotlighted the Draize test that regulators realized that there is no need to test lye and oven cleaner in the eyes of live rabbits.

I think we have to start with the concept that animals only be used as a last resort. When they are used, we have the obligation to undertake serious productive research to develop alternatives. And that in regard to those animals still being used, that we minimize pain to the very minimum.

And I think that this committee, by requesting such reports from the National Institutes of Health, from the national toxicology program and from Health and Human Services, will be raising their consciousness; will let them know that it is the sense of Congress that the suffering of animals does count for something and that we can raise the quality of our lives without inflicting suffering on massive numbers of innocent animals.

Thank you.

Mr. WALGREN. Thank you very much, Mr. Spira. We appreciate that.

[The prepared statement of Henry Spira follows:]

October 13, 1981

Henry Spira:

Testimony For Subcommittee on Science, Research and Technology
U.S. House of Representatives

Animal rights is in the air. It is caring about the quality of all life, recognizing our kinship with all feeling beings. There is a direct link between respecting the rights of humans and animals. In both cases we take into account the interests and needs of others; treat others the way we'd want to be treated were we in their place and consider it wrong to harm others.

We maintain that animals, like people, are not merely things - they are not lab tools. Their suffering does count; be they primates or rodents or cats or dogs, pain is as vivid to them as it is to you and me. The issue is not humans versus animals, the issue is consistency: we feel it's wrong to harm others.

But the reality is that most animals are victims of an expanding holocaust, a world of the living dead, of total domination, of fear and terror.

We are not discussing 'cruelty', we are not focusing on intentions; we are concerned with beueaucratic inertia, with an institutionalized mind-set which transforms living, feeling beings into lab tools. We are concerned with the one hundred million lab animals whose suffering is intense, expanding, systematic and socially sactioned. What can be done?

In theory, no one wishes to make any living being suffer, but in practice, in reality, one hundred million lab animals do suffer. What can this sub-committee do?

I believe that this sub-committee has an almost unique opportunity of doing what is good for the public, for the lab animals, and for productive science while saving taxpayers' dollars.

This sub-committee should take a stand that federally funded or promoted live animal research or testing may only be done if there are no alternative ways, if the research is a practical way to seek answers of crucial importance to public health, if there is the utmost effort to minimize pain and develop non-animal systems.

Where alternatives are available, use them; where there are none, find them. And immediately stop all unnecessary live animal research. Good starting points are the behavioral sectors and safety testing.

We need to change the mind set so that lab animals are only used as a last resort, after all other options have been eliminated, after literature searches and searches of our own sensibilities as to justifying the pain in return for the hypothesized results.

We need to change the mind set, the knee jerk reflex of automatically associating research with caged animals under artificial conditions subjected to crude and violent assaults on their bodies.

This subcommittee needs to institutionalize accountability and thereby cut down the number of lab animal victims right away. We need to make painful choices and we need to make them carefully and promptly.

I believe that a most productive focus for this subcommittee is federally funded behavioral experimentation. We've had experience in this area. We stopped 20 years of federally funded deliberate mutilations of cats and kittens to then observe their sexual behavior, at the American Museum of Natural History.

We publicized the experimenters own papers and the public became outraged at the Museum's gross and grotesque perversion of science. The 'research' cost taxpayers half a million dollars, during 20 years, in order to blind cats, to deafen them, to deprive them of sense of touch, and of smell. For what? For crude, absurd sex experiments - as if you or I or cats are sex machines to be mechanically rearranged. The Museum's experimenters cited similar experiments over the past 80 years, with the usual contradictory results. Were it not for the public outrage, this waste of tax monies and the intense suffering would still be going on. The end result of twenty years of horrors was that they accomplished nothing at all.

The Director asserted the Museum's "freedom to study whatever it chooses, without regard to its demonstrable value." But there is no freedom to inflict pain on others for curiosity's sake. Nor is there freedom to waste taxpayers' monies.

Dr. Roger F. Ulrich, of Western Michigan University, was a leader in agression studies, using experimental animals. He shocked, frustrated and drove primates to attack themselves. Finally, he recognized the horror and closed his animal labs. "I shocked many monkeys. What did that really teach me about myself. I was the aggressive one." He admitted that"the results of my work did not seem to justify its continuance. Instead I began to wonder if perhaps financial rewards, professional prestige . . . were the maintaining factor."

Now is the time for this subcommittee to institutionalize accountability and to demand an immediate halt to all pseudo-science behavioral experiments; thereby with one bold stroke abolish an enormous amount of animal suffering, while saving federal funds to be reallocated towards upgrading safety testing through non-animal systems, to promote health, instead of creating victims.

Dr. Alice Heim, in her Presidential Address to the Psychology Section of the British Association for the Advancement of Science asked"Firstly, how important and informative are the ends? Secondly, ...to what extent is it permissible to use means which are intrinsically objectionable?" And asserts that "some knowledge is too trivial to be valuable in any sense."

There is increasing questioning of deprivation, learned helplessness, electric shocking, radiation, aggression experiments. These are being perceived as massive public works programs for dull PhDs.

After the public had found out what was happening at the Institute of Behavioral Research, in the Congress' backyard, the NIH cut off the funding within the month. This needs to become the pattern. Congress appropriates the funds and must demand accountability from the funding agencies. And this includes shutting down all live animal experiments which are not of crucial relevance.

This subcommittee could demand a status report within six months, a public review of all behavioral experiments using federal funds, with summaries to be written in simple, clear English. Questions to be answered include: What is the specific mission, what is the question that this reasearch seeks to answer. How does this research benefit the public or the environment? Are there better ways to find these same answers? Is it possible to dispense with crudeness and violence by substituting elegance and creativity?

In terms of dollars and suffering, how is this research cost effective? Could this research be done without animals? With fewer animals? With less intrusive methods?

By demanding a critical, public accounting, this subcommittee may well be able to cut out an enormous amount of animal suffering and wasted dollars.

In addition, this subcommittee could request the Office of Technological Assessment or the General Accounting Office to do a retrospective study to evaluate the application, if any, of animal behavior experiments. Such a study could provide guidelines for the future. It could also impact on the research mind set, so that animals are only used as a very last resort to find answers to questions which are truly crucial.

Dr. Harold Feinberg, while president of the American Association for the Accreditation of Laboratory Animal Care, explained that he used dogs in open heart surgery research. He has counted the cost. He is dealing with life threatening situations. And while the dog certainly has not volunteered to be killed, DR. Feinberg consciously minimizes the dog's pain, so the animal is anesthetized and never wakes up again.

But while their numbers are increasing, there are still very few Dr. Feinbergs who will only do animal experiments if they are clearly relevant to matters of life and death, who assure themselves that there are no alternatives, and then reduce pain to the absolute minimum.

Still, Dr. Feinberg is not alone. Productive scientists are beginning to think about lab animals in different ways. Thus in connection with current toxicology, Dr. Joshua Lederberg, Nobel Prize winning geneticist and president of Rockefeller University, said recently: "The one or two or three hundred millions of dollars that we're now spending on routine animal tests are almost all worthless ... I would think the most immediate solution is to redeploy some of our resources ...industry has no choice byt to invest a great deal of money in this area" (World Environment Center, 2/2/81).

Former FDA Commissioner Donald Kennedy noted that "Compared with most other contemporary biological techniques, animal testing is crude, cumbersome and expensive." And a report from the President's Office of Science & Technology Policy asserts that "Extrapolation from the animal mode to humans represents something of a leap of faith."

Not only is there a problem with current archaic animal tests, but the state of the art makes good science feasible. Proposals have been made and work is proceeding on the development of combinations of various predictive non-animal testing systems.

New ideas are now being developed. If attempts to modernize toxicology through non-animal systems had been made in earlier years, it may have been much more difficult to accomplish substantive progress with a reasonable expenditure of time, effort and money. But now, there is an opportunity to mesh with the new scientific possibilities recognized by the best brains in science.

Activity is snowballing. The recent NIH conference suggested that the wave of the future is away from current animal tests. Accelerating pressure is focusing on regulatory agency inertia straightjacketing toxicology into arcane patterns.

A June 1981 report from the Congressioanl Office of Technological Assessment notes the current interest in developing alternatives to the long-term animal bio-assays which cost up to one million dollars per substance, and take from three to five years. The search for reliable, cheaper, quicker replacements has produced more than 100 different short-term tests in the past 15 years. As has been noted, there's the need to combine batteries of such tests to replace current animal tests.

On September 21st, the Johns Hopkins Center for Alternatives to Animal Testing was established through an initial million-dollar grant from the cosmetics industry. The first focus will be on non-animal alternatives for irritation and inflammation. Hopkins expects to hold a major symposium within the next six months to identify additional areas of research.

A New York Times "Ideas and Trends" essay noted that in the wake of our 400-organization 'Coalition', the animal rights movement won several battles. "Viewed against a century of inaction, these stirrings of concern are nothing short of a breakthrough."

Those stirrings include the funding by Revlon of a $750,000 project for alternatives to the Draize rabbit test at Rockefeller University, followed by pledges of $750,000 from Avon, $250,000 from Lauder and other commitments to fund the search for non-animal testing systems.

We are establishing the basic principle that every company which uses lab animals must promote productive programs to develop alternatives in order to phase the animals out of the labs, until none are left.

We insist that the search for alternatives to animal testing become a high priority with government, industry, academia, professional organizations, the regulatory, public and private sectors; that there be an aggressive, productive, innovative search for alternatives to phase out the massive, institutionalized intense suffering of lab animals.

But after spotlighting the issue, we are dependent upon the scientific community to bring this about, by providing the strategy and the strategists for alternative research.

Our Coalition's campaign, and efforts by other concerned groups, is shifting the search for alternatives from ridicule, to dialog, to a modest beginning of activity.

The search for alternatives, the mind set that animals are not mere lab tools, is gaining legitimacy and credibility through association with such prestigious institutions as Rockefeller University, Tufts Medical School, Johns Hopkins. This is part of a continuing step-by-step approach, a cultural revolution, to abandon the popular, automatic reflex of equating research with harming animals.

And what's true for industry is also true for government. This subcommittee could request the National Toxicology Program and all other regulatory bodies to immediately organize high level task forces to develop and validate batteries of non-animal systems to replace current animal tests. And to halt all animal tests where the data is not obviously relevant to protecting public health and the environment.

In addition, the National Institutes of Health could promote the replacement and reduction of lab animals by following the patterns already established to coordinate and promote goal directed efforts as with the Diabetes Committee (Public Law 93-354) and nutrition research.

We look forward to this subcommittee moving in the most direct and productive way towards making changes happen now. Towards accountability: Where alternatives are available, use them; where there are none, find them. Immediately halt all animal experiments which do not deal directly with life threatening issues. Lab animals are to be used only as a last resort. The success of your efforts will be measured by the speed with which lab animals and their suffering, are phased out of the labs.

The need now is not for sympathy, but for getting something done, to get the animals out of the labs by turning towards good science which implies intelligence and sensitivity. We have suggested a number of possibilities and we'd like to hear what your subcommittee feels can be done. Most of us agree that non-intrusive science is likely to be more imaginative and to produce more relevant data.

After spotlighting the issues, we are dependent on scientists to make changes happen, to provide innovative alternatives. It is the expertise, vision and concern of the research community, fueled by the resources from NIH, NTP, industry and foundations, which will make our goal of elegant alternatives, protective of humans, without harming others, come closer to realization.

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EDITOR'S NOTE

Man has long cherished the idea of being the noblest animal—and the most dangerous one. Alone of the world's species, man takes more than he needs, manipulating nature, environments, and habitats to the design that suits him or is most useful for the moment. It is a one-sided competition for man's fellow inhabitants of the planet.

In a remarkably eloquent appraisal of this unthinking depredation, biologist George B. Schaller, director of conservation for the New York Zoological Society, writes of a journey to the Himalayas. In this vast wilderness isolated by time and terrain from the heady currents of the age, man has hunted several species to near extinction. He has destroyed habitats for prey and predator alike and has upset balances that may never be righted again. "Anyone who consciously observes the exponential destruction of wilderness," he writes, "becomes almost automatically an advocate for the natural world. To conserve a remnant of beauty becomes an ideal and this ideal possesses one until it becomes a faith: it takes a believer to understand sacrilege."

Perhaps men like Schaller can eventually arouse the consciousness of man, for he is raising a significant issue, especially pertinent to medical research: Do animals have moral and legal rights to be protected?

At the moment, the issue is coming to a head in Washington as Congressional Committees ponder several pieces of legislation that would, to advocates, greatly extend protection to animals used in scientific research; to foes, the bills would seriously curtail a mechanism for achieving better health for mankind.

While other pressing issues on the national agenda will monopolize the headlines while the animal-rights' bills are discussed, the long-term effects of the latter should not go unscrutinized by the medical profession. *MD's* cover story on the subject explains the issues involved and why the people now behind the animal-rights' controversy have earned the right to be taken very seriously indeed. Certainly, the debate will force us to examine a fundamental question: Is man the custodian of the world or its exploiter?

Since October ends with harvest moon dances and Halloween witches piloting their broomsticks by moonlight, it seemed to be appropriate to devote some editorial space to our celestial neighbor. While most every elementary school student knows about werewolves, tides, and moon rocks as aspects of the moon's pale presence, there are some strong indications that Luna is a more potent, less fanciful, force than all man's superstitions have ever indicated. Smart cops and bartenders know that full moons falling on Friday nights exert a tangible influence on man's emotions (not always for the best), but less street-smart but equally intrepid researchers have found that the phases of the moon have direct correlations with a wide variety of physical changes in the human being, from the menstrual cycle to the frequency of schizophrenic onsets. Maybe, as writer Donovan Fitzpatrick concludes, the folk tales about "The Man in the Moon" might stand revision to "The Moon in Man." Read on.

Ron de Paolo

Ron de Paolo
Editor

THE RIGHTS

MORALITY OR PRACTICALITY?

In the last decade the antivivisectionist movement has come out of the drawing room and into the streets. Animal-rights' activists have demonstrated, picketed, and lobbied Washington in an effort to make fundamental changes in the way animals are used in biomedical research. They have replaced sentiment with science and have amassed studies to show that researchers can get quicker and better results by replacing live animals with alternate technologies.

The issue has been discussed and debated by the scientific community, and in February, 1981, the National Institutes of Health (NIH) held a three-day symposium that explored alternatives to the use of live animals. There was considerable Congressional pressure to hold the conference. Four animal-welfare bills are now before the House Subcommittee on Science, Research, and Technology, and hearings are being held this month. Subcommittee Chairman Doug Walgren of Pennsylvania says that among the issues to be covered are: "Ways to promote more humane and appropriate use of animals, including alternatives to animal use where possible, and a study of those areas in which animal-based research or testing remains crucial to the protection or enhancement of human health."

The most controversial bill before the Subcommittee is H.R. 556. It calls for the establishment of a National Center for Alternative Research to be composed of representatives from every federal agency that conducts or sponsors live animal research. The bill mandates that each agency commit no less than 30% and no more than 50% of research appropriations to developing alternative methods.

Groups that support the bill, such as United Action for Animals, say that scientific research and humane treatment of animals are not in conflict and that the bill will save animal lives and money as well. Opponents of the bill, such as the National Society for Medical Research, insist that it would "seriously hamper medical progress and that the reallocation of funds won't really hasten anything."

If a bill does emerge from the October hearings, it will be the fourth major federal statute on animal welfare in this century. The first was the 1906 "28-hour Law" protecting livestock shipped by rail. The second, the Humane Slaughter Act, required all packers selling to the federal government to prevent needless suffering in slaughterhouses. The current law regulating laboratory animals, the Animal Wel-

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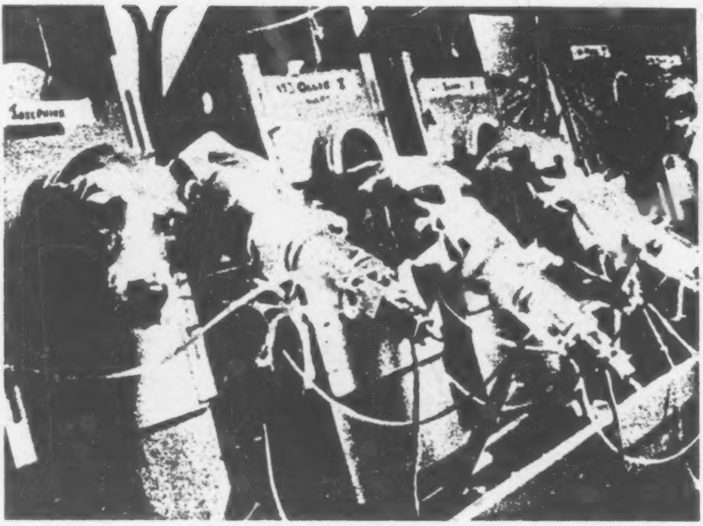


Syndication International/Photo Trends

In a 1975 British experiment offensive to supporters of animal rights, beagles were subjected to tobacco smoke equal to 30 cigarettes a day administered through masks fitted to their faces.

fare Act of 1970, is based on a 1966 statute. Its provisions apply to research facilities, exhibitors, and wholesale pet dealers. The act established the "humane ethic that animals should be accorded the basic creature comforts of adequate housing, ample food and water, reasonable handling, decent sanitation, sufficient ventilation, shelter from extremes of weather and temperature, and adequate veterinary care, including the appropriate use of pain-killing drugs."

The law is enforced by the U.S. Department of Agriculture (USDA) and does not include standards for the most widely used experimental animals, mice and rats. While setting standards for the care of laboratory animals, the act tries to preserve the freedom of the experimenter. A House report on the bill notes that it "in no manner authorized the disruption or interference with scientific research or experimentation. Under this bill the research scientist still holds the key to the laboratory door."

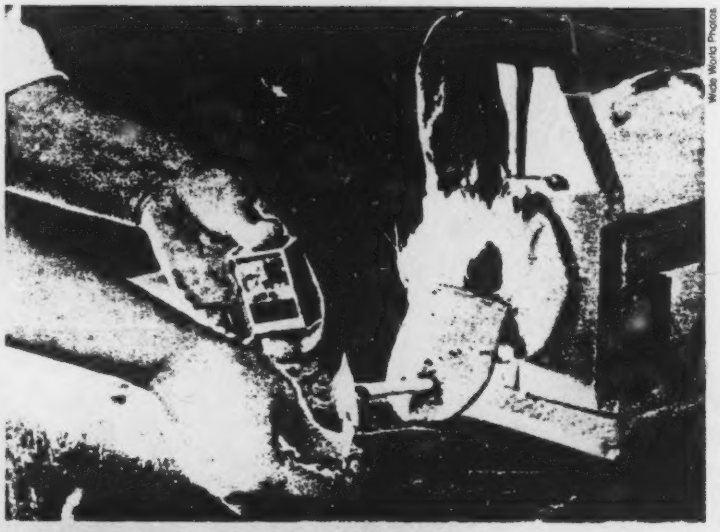
Animal-welfare critics say the USDA has lacked both the will and the money to enforce the law, but they concede that the scope of the problem is enormous. In the last 20 years the use of experimental animals has more than quadrupled, from 20 million in 1958 to 90 million in 1978. The current total includes about 50 million mice, 20 million rats, 5 million amphibians, 5 million birds, 4 million hamsters, 3 million guinea pigs, 2 million rabbits, 500,000 dogs, 200,000 cats, and 30,000 monkeys. The U.S. uses more experimental animals than the rest of the Western Alliance combined. The Japanese use some 13 million, followed by the United Kingdom with 5.5 million, and France with nearly 4.5 million.

About a third of all animal testing in this country is conducted or supported by 15 agencies of the federal government. The largest is NIH and one of the most controversial is the Department of Defense (DOD). In 1978 the Indian government, which supplied 12,000 wild rhesus monkeys a year to the U.S., banned further export of the animals because the DOD had breached a 1955 agreement not to use the animals in weapons research. The DOD has been involved in other controversies as well: When the press reported that beagles were being used for testing chemical warfare agents, the House Armed Services Committee was swamped with angry protest letters. The mail was heavier than any the committee had received since President Truman fired General Douglas MacArthur.

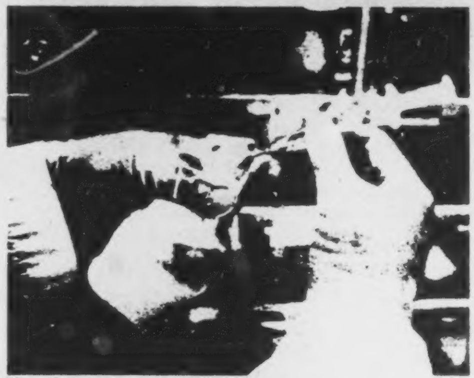
In the 1970s passage of the Toxic Substances Control Act created a huge demand for test animals. In 1977, one year after its passage, the federal government's legal obligation to test, evaluate, and regulate harmful chemicals involved the resources of 37 government agencies with a budget of over $640 million. In 1980 that figure rose to over $1 billion.

The country's need for laboratory animals seemed insatiable, and the animal-breeding industry expanded to fill the gap. There are no hard figures on the dollar sales in lab animals but one estimate puts it at over $100 million annually. The largest supplier is the Charles River Breeding Laboratories in Wilmington, Massachusetts, and according to Gilbert Slater, corporate director of marketing, Charles River produces 20 million animals yearly and has about 20% of the market.

Another source of research animals is local pounds, but since 1979 such animals have been increasingly difficult to obtain. In that year animal-



Wide World Photos



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In a 1967 experiment in Eastern Europe, left, a rabbit is used to learn if tobacco slows down the rate of growth. In Virginia, below left, a laboratory mouse is used to test drugs.

rights' groups were successful in repealing the Metcalf-Hatch Act, a 25-year-old New York State law that required public shelters to supply state laboratories and medical schools with cats and dogs. This past June a similar law was repealed in Los Angeles, and animal-rights' groups are now targeting other cities to legally protect the welfare of animals.

According to statistics from the Humane Society, more than 15 million dogs are destroyed annually in local shelters. Thurman S. Grafton, a veterinarian and former executive director of the National Society for Medical Research, described the repeal effort as "ironic and contradictory." If scientists cannot obtain dogs, said Grafton, "not only would the animals in the pound be destroyed but an equal number would have to be obtained from breeders. That would double the number of animals dying for the same cause."

At the heart of the issue is the question of whether animals have the moral and legal right to be protected from experimentation. Animal-rights' advocates say yes; their opponents say no: Animals should be treated humanely, but they are essential to progress in biomedical research, and human needs come first.

Stephen Burr, a historian and lawyer, traces the latter view to the early Greeks who taught that man was privileged among the world's species because of his capacity to reason. The biblical mandate of the ancient Hebrews, Burr adds, also separated man from the natural world. In *Genesis*, man was told by God to "fill the earth and subdue it; and have domain over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth."

The first reawakening of man's awareness of his dependence, and ultimately of his responsibility to the natural world, came, says Burr, with the flowering of the Romantic movement in the late 18th and early 19th centuries. Philosophers emphasized the organic nature of the world, and Emerson and Thoreau wrote that man's happiness depended upon his ability to live harmoniously with the rest of creation. In the last half of the 20th century this belief is being reinforced by the ecological and environmental movement and the work of primatologists who emphasize the complexity of the mental and emotional lives of animals and the moral obligation of scientists to treat them with respect.

The debate between the rationalists and the romantics goes on. Cora Diamond, a philosopher from the University of Virginia, puts the question this way: "The dispute is not over a moral issue,

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but over whether there is a moral issue." Those that deny the existence of a moral issue, writes Diamond, compare experimental animals to "delicate instruments...to be used efficiently and cared for properly." They argue that every advance in medicine is founded on animal research and that hardly any cure, vaccine, operation, or drug has come about without their use.

Those with the opposite view insist that animals have a moral and legal claim on the human race. They point to the works of the Australian philosopher Peter Singer, who wrote in 1973 that the claims of animals on the human conscience are not based on "sentimentality, not on an animal's ability to reason or talk, but on his capacity to suffer."

The natural successor to the human-rights' movement is the animal-rights' movement, Singer adds, and human attitudes toward nonhumans are "a form of prejudice [illegible] less objectionable than racism or sexism." This represents "a challenge that demands not just a change of attitudes but a change in our way of life, for it requires us to become vegetarians."

For many in the animal-welfare movement Singer's works have been both philosophical and political watersheds. They have helped the movement to broaden its base and change its strategy and tactics to those of the liberation movements of the last 20 years.

Many scientists were receptive to this pragmatic approach and indeed there was a precedent for such a view. In 1959, 14 years before Singer wrote on animal rights, W.M.S. Russell, a research fellow at the Department of Zoology and Comparative Anatomy at University College London, and his research assistant, R.L. Burch, published *The Principles of Humane Experimental Technique*. The book, considered a landmark by scientists, sets the stage for a "historic compromise." The English zoologist Peter Medawar, who won the Nobel prize for medicine in 1960, wrote in a June, 1981, review in *Lancet* that "There may be no solution that is fair both to animals and to human beings, but all scientists can work towards putting into effect what Russell and Burch describe as the three Rs of humane experimental practice: Replacement of animals by non-sentient systems wherever possible; Refinement of experimental procedures; and Reduction of numbers of animals used to the very minimum that will serve a useful purpose."

Animal-welfare groups were also seeking a middle ground. In 1980, in Illinois, the Society for the Prevention of Cruelty to Animals held a conference that brought together animal-rights' activists and members of the scientific community. The keynote address was by two professors of philosophy, who presented the extreme positions on the issue and then formulated a compromise: "Since animals are innocent and harming them is a great evil...it follows that we may harm animals for scientific purposes, only to prevent much greater evil."

Dr. Harold Feinberg, professor of pharmacology at the University of Illinois Medical Center, commented on their compromise: "I kill dogs in the interest of finding out how their hearts work. I do this to make it easier for someone who has congenital heart disease, or angina, or is dying of premature atherosclerosis to get a bypass operation and 10 more years with his family.... I do worry about it because I agree with what's said here and about animals being innocent and animals experiencing pain. But I don't know any other way. I don't think that we can do the kind of work that I do on cell cultures or bacteria....We must often do experiments that must ultimately result in the death of an animal, but the thing that one must be careful of is never to inflict pain. I think that is a reasonable rule and one I would want to live by."

In recent years organized groups of scientists have begun to address the ethical dilemmas posed by animal experimentation. The Washington-based Federation of American Scientists (FAS) issued a special report on animal rights. The purpose of the report, said FAS director Jeremy J. Stone, was to "minimize animal suffering and raise consciousness among scientists." Stone also helped to organize the Scientists Center for Animal Welfare, an organization of about 1000 members that will hold its first conference next month on "Scientific Perspectives in Animal Welfare."

Another group, organized in early 1981, is the Scientists Group for Reform of Animal Experimentation. Their efforts will be concentrated on legislative reforms, says Herbert Rackow, M.D., professor emeritus at Columbia University's College of Physicians and Surgeons. The organization will lobby Congress "to pass legislation that will protect animals from the worst abuses, in particular from psychological experiments done for trivial aims that have little chance of adding to the world's knowledge."

There are no exact figures on the number of organizations devoted to animal welfare in the U.S. Estimates vary from 1500 to 2000, and they range in size from groups of four or five people to memberships in the thousands. Their tactics vary, from persuasion to confrontation: One group, the Animal Liberation Front, raided New York University Medical Center and freed two dogs, a cat, and some guinea pigs.

In 1976 a group of 11 organizations took on the New York Museum of Natural History and won more than a symbolic victory. They were protesting a study of the sexual changes that occur in domestic cats who have been deprived of sensation or brain function. The controversy began when a high-school teacher and journalist, Henry Spira, who had been active in trade union and civil-rights' organizations, used the Freedom of Information Act to obtain research proposals submitted to NIH by Lester R. Aronson, the curator of the museum's department of animal behavior. Among the experiments on cats described by Aronson were ablation of the olfactory bulb, cauterization of parts of the brain, and surgical severing of the penal nerves.

Spira charged that the experiments were "unnecessary" and that the museum was a symbol for the "millions of animals suffering in repetitive makework tortures, which add nothing of value to the sum of human knowledge." He organized a campaign against the experiments. Demonstrators marched in front of the museum; protest letters were sent to Congress and the issue was raised in the House of Representatives. Some 400 patrons canceled their museum memberships and several wrote saying they would cut the museum out of their wills.

Aronson defended his experiments, saying that the studies had led to a better understanding of deviant sexual behavior. He discovered that brain lesions caused the cats to lose a degree of sexual selectivity, so that a tomcat might try to mount a stuffed panda. His efforts to save the study were unsuccessful, however. The museum, caught up in a public-relations' nightmare that was pinching its pocketbook and damaging its reputation, agreed to halt the experiments.

In the spring of 1980 the coalition, now swollen to more than 400 groups, opened its drive against the Draize test, which is used to determine whether a chemical is likely to irritate human eyes. The 40-year-old test introduces toxic substances into the eyes of white rabbits, an ideal test subject because they have no tear ducts to wash away the compound.

To satisfy federal regulations, the cosmetics industry uses the test to measure the safety of their products. Spira, spokesman for the coalition, says that Revlon was targeted "because it was an industry leader with the largest sales. We had to drive a wedge in somewhere, and Revlon gave us the needed publicity. The firm's name is strongly associated with beauty, and our slogan became 'hurting rabbits isn't beautiful.'"

To drive home their point, activists, dressed in rabbit costumes demonstrated outside Revlon's New York and London offices. The coalition took out full-page ads featuring a picture of a white rabbit with bandaged eyes. Above the picture was a single question: "How many rabbits does Revlon blind for beauty's sake?" The text beneath the picture asked readers to write to Revlon saying they would boycott

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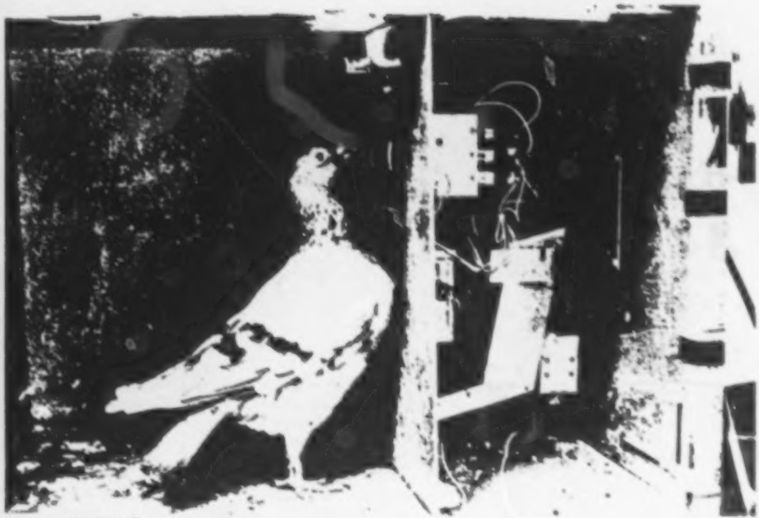
UPI

Under study, top, is the sex life of the octopus. In Florida, center, scientists take a sample from the mouth of a baby alligator in a search for the bacterium Aermonas, which infects the reptiles and fish in the area. At Audubon Zoo, New Orleans, above, a gorilla is prepared for root canal work.



Wide World Photos

In a psychological test at Arizona State University, a pigeon pecks to put out a white light, then pecks a colored light to indicate if it or a computer put out the white light. When in doubt, it will give the response with the greatest promise of reward in food.

its products until the company funded a crash program to develop non-animal eye irritancy tests.

Six months later Revlon announced that it had awarded a three-year, $750,000 grant to Rockefeller University for the development of an alternative test. Avon Products, Inc., followed suit, also with a $750,000 grant, and the cosmetics industry's trade association announced that it was planning to establish a national center devoted to alternative means of research.

Animal-welfare groups are also contributing to the search for alternatives. This year the New England Anti-Vivisection Society awarded a $100,000 grant to Dr. William Douglas of Tufts Medical School. "We are currently at the stage of developing methods for the growth of human corneal endothelial cells in vitro," Dr. Douglas says. "These cell cultures will then be used to evaluate the potential toxicity of various chemicals. We fully expect to develop the system within two years. It will certainly be more economical, more accurate and more rapid."

Regulatory agencies that made animal tests mandatory are also responding to pressure from animal-rights' organizations. The Consumer Product Safety Commission has suspended routine in-house animal tests, and in May of this year the agency announced that "equivalent data would be acceptable in an enforcement action."

One of the most hopeful areas of research for alternative testing has come from the work of Dr. Bruce N. Ames of the University of California at Berkeley. Because damage to DNA appears to be a major cause of cancer, heart disease, and genetic birth defects, Ames developed a bacterial test based on a chemical's ability to cause mutations in the DNA molecule.

Ames notes that since there are thousands of untested chemicals in use, "existing animal tests and human epidemiology alone are inadequate for this task because of the time, expense, and the difficulty of dealing with complex mixtures. Newly developed, non-animal short-term tests, most of them assaying for mutagenicity, are key tools."

Some scientists are not so optimistic about the possibility of replacing animals in essential biomedical research. Maurice B. Visscher, Ph.D., M.D., from the University of Minnesota Medical School writes in *JAMA* that the use of living vertebrate animals in research is "essential to progress in medical science....The assertion that biomedical scientists are not using cell and tissue culture methods where they are useful is totally false."

In an interview, neurobiologist John M. Allman of the California Institute of Technology said that the area of greatest reform in animal testing is in toxicology and drug testing mandated by federal regulatory agencies, and possibly in the production and testing of the Sabin polio vaccine.

But, he added, the bill before Congress that has as its goal the elimination of research duplication strikes at the heart of the scientific process. Since Bacon, science has depended upon the ability to replicate results and to confirm them in parallel experiments. As to alternative methods, the computer, for example, is a tool but not a substitute for animal research. "Because of the awesome complexity of biological systems, like the brain," Allman concluded, "there is no way you can achieve a computer simulation of it."

Chemical & Engineering News
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A challenge for toxicologists

Joshua Lederberg is a geneticist, a Nobel Laureate, and president of Rockefeller University. He spoke earlier this year in New York City at a briefing held at the World Environment Center, a nonadvocacy information service of the United Nations Association of the U.S.A. Here, verbatim, is part of what he had to say.

With all of the enormous expansion both in quality and in quantity—that is, in the variety and total material—of the chemical industry, I believe today that we're in a far healthier position than we were 30 years ago. Thirty years ago, there were fewer substances being emitted, but the abandon that they were being dealt with! You had workers walking knee deep in solvents and paying absolutely no attention to them. Since then, there has been a sharp increase in vigilance. With respect to a wide variety of substances, I am quite confident that the average exposure to many of these chemicals is down by a factor of 100 or 1000 compared to what it was in the early 1950's, just on account of the awareness that has been generated, the public sensitivities about these matters. There is no major industry today that does not now have a deeply ingrained environmental apparatus—procedures, bureaucracy, and doctrine—with respect to control of environmental problems. This is an enormous advance over what was the case 30 years ago.

We have at this point, of course, the responsibility to work out procedures that will provide for appropriate surveillance of new substances, for prevention of human exposure where it really is of some consequence. This in turn presents an enormous challenge to scientific enterprise; it is just beginning to be met.

If there is any message that I would like to see conveyed it is the gross inadequacy of our present knowledge base to face properly the enormous environmental challenge that we have at the present time.

I think the testing of substances could be greatly improved, improved above all by better understanding of the mechanisms by which these substances work. Right now there is almost no rationale for deciding whether the mouse, the rat, the rabbit, the guinea pig, or the monkey is going to be the better model for effects on human behavior. In fact, very few substances have been tested using more than one species in order to build up a body of theory to project in what way the human is likely to be more or less like other animals.

For that reason, I have felt a particular priority should be given to that discipline that hardly exists today, which I would call comparative toxicology. When it comes to toxic substances the prevailing doctrine is to find the most sensitive animal and if you can get a toxic effect, there is a potential hazard in man. Therefore, under most circumstances, you need to abolish the substance if you can produce cancer in that animal. Well, I can't argue against that in any affirmative way, with the present state of our knowledge, but it is obviously fraught with all kinds of difficulties and false positives. It is being excessively rigorous in a few cases when there are 10,000 other things that haven't been looked at yet.

First of all, understand that the one or two or three hundred millions of dollars a year that we're now spending on routine animal tests are almost all worthless from the point of view of standard-setting. It may be appropriate for setting alarms.

I would think the most immediate solution is to redeploy some of our resources. The resources are not only money, there is the time and effort. The whole quality of the field of toxicology has been so drowned by the requirement to do these kinds of tests that that, in itself, has made it a less respectable discipline from the point of view of more fundamental biological interests.

The point I am trying to come down to is that it is simply not possible with all the animals in the world to go through new chemicals in the blind way that we have at the present time, and reach credible conclusions about the hazards to human health. We are at an impasse. It is one that has deep scientific roots, and we had better do something about it. ☐

Views expressed on this page are those of the author only and not necessarily those of ACS

Mr. **Walgren.** Dr. Rowan.

STATEMENT OF DR. ANDREW ROWAN

Dr. **Rowan.** Thank you, Mr. Chairman. I welcome the opportunity to speak today.

I am Andrew Rowan. I am employed as the associate director of the Institute for the Study of Animal Problems and will be giving my testimony here today on behalf of the Scientists Group for Reform of Animal Experimentation. This is a recently formed group that at last count had about 50 members of the scientific community who felt that this was a serious issue that needed to be dealt with immediately.

We recognize that human and animal benefit have been derived from animal research and are not opposing legitimate research; but we do differ, and sometimes quite markedly, as to what constitutes legitimate research.

We are also concerned at the lack of attention that is paid to the idea or concept of alternatives, and I would stress that it is a concept. It is not something that one picks up off a laboratory bench and looks at. It is an attitude of mind, as George E. Brown, Jr. mentioned yesterday.

We define an alternative as any system that would replace the use of animals altogether, that would reduce the numbers required in any test or research protocol or that would refine the system such that there would be no suffering or would reduce the suffering that the animal would endure.

We consequently support H.R. 4406 which we feel does address the issue of suffering. In this bill, the animal care committees would be empowered to review the research methods proposed and not just the facilities in which that research was going to be conducted. This is a very important issue and one in which I would like to support the former panel when they asked for outside members to be involved. It would be relatively simple for an outside member to ask the question, "Why?" and that is really what we are dealing with at this stage—a change of attitude.

On the other side of the coin are the bills advocating varying degrees of support for alternatives, the goals of which we support. As an example of what I mean by an alternative I would like to refer to the LD50 test which has already been discussed twice today. This test is designed to determine the dose that will kill half the population of animals to which it is given. It is done with 60 to 100 animals usually in order to obtain some statistical precision. This is totally unnecessary and it is pseudoscience. I have just returned from two meetings in Europe on this test where I was part of the speaking panel, and all the scientists involved recognized that the LD50 test, as used in regulations was an unnecessary and gross waste of animals. In fact, Dr. G. Zbinden, toxicology consultant for the World Health Organization, has suggested a set of guidelines on what should be done to reduce the number of animals that are slaughtered needlessly in this test.

One of the problems with alternatives is the lack of real commitment to the concept by Federal granting agencies. As long as there is no active encouragement, and I stress that it must be active and not a mere paper trail, researchers will continue to pay lip service to the idea without concentrating their minds on the topic. Experience has shown that money is an excellent concentrating force and there are a number of ways in which the Federal Government could make money available, without appropriating new funds. They all involve a change in priorities.

The development of new techniques is a critical aspect of the advance of scientific knowledge. We, therefore, believe that substantial support for the concept of alternatives will have a beneficial impact and that the availability of money is an excellent way of concentrating scientific minds. In fact, the Draize test campaign which produced in excess of $2 million to look for alternatives, did flush out three good research protocols to investigate the possibility of replacing the rabbit eye-irritancy test with a nonanimal system.

All we are really asking for, I suppose in this instance, is a change in priorities. The national toxicology program spends large sums of money on animal bioassays which are defective in many ways, as you heard from Dr. Brusick yesterday. Protection from carcinogenicity can be done as effectively and much more cheaply in nonanimal systems.

The evaluation of risk may require animals, but we believe that the national toxicology program spends an excessive amount of money on animal bioassay. If this money was reprogramed to the development of new methods, as their mission directs, we feel that toxicology would more rapidly become a science and not remain the arcane art that it is at the present.

In the Division of Research Resources within NIH they have the specific mission to conceive and support the development of new technology, yet tissue culture, a technique with tremendous potential remains largely unsupported by the Division of Research Resources.

At the same time over $16 million a year are provided to maintain seven private research centers around the country. There have been discoveries emanating from these centers over the last 15 years, but the cost-efficiency of those discoveries has been questioned. Perhaps it is time for the Division of Research Resources to alter its priorities substantially and to begin to support some of the techniques that have been identified as possible alternatives.

I would like to echo the statement of Dr. Giannelli that our main problem is one of attitude.

The research guidelines about which we heard so much yesterday and will doubtless hear more today are good when it comes to dealing with the issues of animal care, although they should be heeded more, as we have heard. But they are grossly deficient when it comes to offering guidance on what techniques should be used and what the moral and ethical situation is.

The passage of a bill combining the approaches as outlined in both H.R. 4406 and the alternatives bills would go a long way toward changing attitudes. We do not believe that science itself will suffer.

The development of new techniques is a critical aspect of the advance of scientific knowledge, and we believe that substantial support for the concept of alternatives will have tremendous benefit, both for human health and for scientific knowledge in general.

Mr. Chairman, that concludes my testimony.

I would just like to say that yesterday we heard about pain and suffering and various other issues. I have a detailed statement which I would like your permission to enter into the record.

[The prepared statement of Dr. Rowan follows:]

STATEMENT OF DR. ANDREW ROWAN, ASSOCIATE DIRECTOR, INSTITUTE FOR THE STUDY OF ANIMAL PROBLEMS

Summary

We recognize that some benefit has derived from animal research and we do not oppose legitimate research on animals. However, we do differ with scientists as to what constitutes "legitimacy" and we are very concerned at the lack of attention paid to alternatives. The concept of alternatives means different things to different people. We have always used the term to refer to the three R's of Replacement, Reduction, and Refinement. That is, it covers not only any technique which can replace the use of live animals altogether, but also those techniques which either reduce the number of live animals required for a particular study, or which reduce the amount of suffering which the animals undergo. As far as the question of animal suffering is concerned, we wholeheartedly endorse the approach in HR 4406 introduced by Congresswoman Pat Schroeder which mandates minimum humane standards for lab animals. We also support the other initiatives to encourage the development of alternatives which would replace the use of laboratory animals or reduce the demand. The bills are HR220, HR556, HR930, and HR2110. We hope that this Subcommittee will see fit to report out legislation realizing the goals of these bills.

As an example of the type of alternative to which we refer, we would like to draw your attention to information gained during speaking engagements last month in Holland and Sweden. In both countries, I had been invited to address groups of toxicologists on the merits or problems of the LD50 test. The LD50 is an acronym for Lethal Dose - 50%, a test designed to produce an estimate of the dose of a compound that will kill 50% of the animals to which it is adminstered. Usually 60 to 100 animals are used in order to produce a figure with its standard deviation and other statistical information. At least half of the animals should die of poisoning, the remainder are killed at the end of one or two weeks.

The argument in favor of the test is that it provides some measure of the toxicity of a compound. On the other hand, the argument against it is that one does not need to use 60 animals and that exactly the same quality of information can be obtained from 6 to 10 animals. In the meetings in both Holland and Sweden, the participants agreed that the use of 60 to 100 animals to determine the LD50 was a waste of laboratory animals. Instead, it would be perfectly adequate to use only a few animals to gain a rough idea of toxicity. This is a good example of where a simple modification to a currently used testing procedure can still produce excellent scientific data while eliminating the need for several million animals a year.

However, we have learned from experience that one cannot change accepted practice very easily, even when one has a great deal of scientific support. In our campaign against the Draize eye irritancy, it took a concerted and co-ordinated effort by over four hundred animal welfare groups to get Federal regulatory agencies to allow even modest changes to the guidelines to the Draize irritancy test to take into account animal welfare considerations. For example, new guidelines published in 1981 by the Interagency Research Liaison Group, noted that known irritants should not be tested, that the number of rabbits required should be reduced, and that local anesthetics should be used to reduce animal suffering.

The interesting point is that these changes, such as not testing known irritants in the rabbit eye, had widespread support from the scientific community but lawyers and adminstrators in regulatory agencies did not want to make the changes. A few rabbits will now escape the suffering of the Draize test, but millions of animals will still be needlessly poisoned to death in the LD50 test because of the senseless bureaucratic desire for totally specious statistical precision. In fact, it is highly probable that we could make a major change in our approach to toxicity testing and safety evaluation which would result in major cost and time savings.

In 1976, four toxicologists published a letter in Science (Vol. 193, page 834) in which they suggested that a battery of screening tests could be devised which could "allow a ten-fold reduction in cost and a five-fold reduction in time for toxicological testing." They also stated that they "would expect little or no sacrifice of safety." There were some half-hearted attempts to follow up this idea but the real support for the necessary basic research was not forthcoming.

As an example of the type of savings that one can make in this area one only need look at the use of animals to detect carcinogens. To conduct a full scale test according to National Cancer Institute Guidelines would take approximately 3 to 3½ years and would cost in the region of half a million dollars. Using mammalian and bacteria cell cultures would only take about six weeks and would cost about ten thousand dollars. While it is not yet widely accepted that the battery of cell tests is an adequate replacement for the animal system, there are practicing toxicologists, such as Dr. David Brusick of Litton Bionetics, who argue that the cell cultures are as good as the animal tests, if not better, in identifying potential carcinogens. When it comes to a thorough evaluation of the risks of identified carcinogens, however, they still consider that animal studies must be performed.

In many cases we could safely employ only a detection system and not undertake all the large scale and costly bioassays that are now being funded under the National Toxicology Program. That program receives approximately eighty million dollars a year. If one was to change priorities so that more money was put into basic computer and cell science research, we would start to see some of the advances that could provide more reliable hazard assessment at a fraction of the costs of current protocols. This would be as beneficial to the American consumer and taxpayer as to business and government regulators.

The National Toxicology Program is not the only Federal funding agency where a shift in approach could help both the cause of science and of the animals. At the National Institutes of Health, the Division of Research Resources (DRR) is responsible for identifying and meeting the resource needs (including technique and model development) of the NIH. The DRR operates five programs, including the biotechnology and animal resource programs. In 1976, a DRR- funded review of its own mission found that the DRR had not adequately fulfilled its role of conceiving and creating resoruces for the biomedical community.

From our point of view, this shortcoming applies specifically to the issue of alternatives. The DRR Animal Resources Board has approximately $24 million for the specific support of animal resources and the development of animal models. Two thirds of this money is allocated for core support to the seven Primate Research Centers. It is by no means clear that these centers are providing good value for money. We think that reallocating some of these funds specifically to the development of alternatives would be a more efficient use of the funds as well as being more responsive to the concerns of the taxpayer. There are other initiatives possible both within the DRR program and in NIH itself.

We have repeatedly been told that one cannot throw money at the problem but we are not asking for this. We are only asking that at least some Federal money be allocated specifically to support the resource needs of alternatives. Scientists are, after all, only human and while the availability of money will not force them to think, it does encourage them to concentrate their minds in specific areas. We believe that support for alternatives will not only be good for the animals, it will also be very good for science since biomedical progress is dependent not only on the presence of good minds, but also on the availability of new and more sophisticated techniques.

It is also clear that review procedures to regulate the welfare of laboratory animals are defective. The inspections carried out by the U.S. Department of Agriculture are widely regarded as a waste of time by laboratory animal scientists. Many inspectors do not have the knowledge or interest required for adequate enforcement of the Animal Welfare Act. The review procedures at NIH and other Federal funding agencies are also inadequate judging from our own investigations and the nature of some of the research that is funded. In conclusion, we ask the subcommittee to propose a constructive and far-reaching initiative on alternatives which would result in both administrative support and funding for the idea as well as tighter review of animal research protocols along the lines of those proposed in HR4406.

SCOPE OF THE PROBLEM

Animal (1) research has been conducted on animals since ancient times but until the present century, only on a relatively small scale. For example, one hundred years ago, laboratory animal use stood at 100th of one percent of today's activity. Fifty years ago, such use was still only 4% of today's demand. Given that animal research was aiding the advance of biomedical knowledge (e.g. the development of insulin and the sulfa drugs) and hence medical practice, it is perhaps not surprising that anti-vivisection campaigns fifty years ago were relatively ineffective.

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(1) Note: For the purpose of the discussion, the term "animal" is used to refer to the main vertebrate classes.

Today, the situation has changed substantially. Not only are vast numbers of animals used every year in biomedical laboratories, but our knowledge of biomedical processes has advanced to the stage where we can realistically consider reducing these numbers substantially. For example, the Swedes have instituted a concerted program emphasizing ethical review of animal research protocols and their use of animals in research has declined substantially in the last few years. While we cannot eliminate the use of animals altogether, we can often modify the procedures so as to reduce pain and suffering. However, apart from the oft-repeated cliche that laboratory animals are well cared for, there are few concerted attempts either to promote the concept of alternatives to laboratory animals or to support research which could lead to a reduction in animal use and suffering.

a) Funding

In 1975, Burger (2) identified expenditure on biomedical research for 1974 as follows.

	$ billion	%
National Inst. Health & ADAMHA	1.95	46.7
Other Federal Agencies	0.80	19.1
Private Industry	1.18	28.2
Non-profit organizations	0.25	6.0

In 1981, $4.6 billion was spent by NIH and ADAMHA on biomedical research. If the other sources of research funding grew at the same rate then almost $10 billion was available for biomedical research in 1981. This represents a considerable increase over the situation after the war when NIH was dispensing only a few million dollars a year. This money has permitted the many advances in biomedical knowledge which have occurred in the last thirty years, but it has also resulted in a vast increase in the number of laboratory animals killed every year. Some now argue that the research establishment is no longer producing sufficient "bang for the buck" and we in the humane movement certainly consider the scale of animal use to be excessive.

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(2) Burger, E.J. (1975) Fed. Proc. 34: 2106-2114.

b) Numbers of Animals

There are many conflicting reports on how many laboratory animals are used every year. We estimate that approximately 60 - 80 million are used annually but others put the figure far lower. The following examples indicate the variation.

(i) The Institute for Laboratory Animal Resources (3) surveyed laboratory animal use every year between 1965 and 1971.

Year	% Return	Total No. of Animals (Warm blooded)
1965	39.5	36,591,000
1966	60.6	39,934,000
1967	50.3	42,497,000
1968	63.0	41,284,000
1969	69.7	52,734,000
1970	49.3	38,732,000
1971	61.1	44,398,000

As is evident, these figures vary considerably from one year to the next and the detailed breakdown shows a number of anomalies (e.g. the number of chickens used varies from 1.7 million to 0.6 million to 1.3 million in a three year span). These figures probably provide a reasonable idea of the lower estimate for total animal use, namely 55 - 60 million. It is pertinent to note that mice account for approximately 37 million and rats approximately 13 million of the total.

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(3) Institute for Laboratory Animal Resources, Annual Surveys, 1965-1971.

(ii) At the end of 1965, W.B. Saunders and Company (4), a group of economic consultants, conducted a market survey of the current and projected demand for small laboratory animals in the USA. Their figures were based a) on NIH use and the determination of NIH use as a percentage of the total demand and b) on extrapolation from the sales figures from a known sample of laboratory animal breeders. There was less than a two percent difference between the two totals and their final tables are given below.

	1965	1970 (projections)
Mice	36.84 m.	59.56 m.
Rats	15.66 m.	25.32 m.
Guinea pigs	2.52 m.	4.07 m.
Hamsters	3.30 m.	5.34 m.
Rabbits	1.56 m.	2.52 m.
Exotics	0.12 m.	0.19 m.
TOTAL	60.00 m.	97.00 m.

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(4) Saunders & Company Market Survey (1966) Information Lab. Animals for Research 9(3): 10.

ILAR SURVEYS (see iv)

Laboratory Animals Acquired by Nonprofit, Commerical, Military, DHEW, and Other Federal Organizations in FY 1968 and FY 1978.

	Number of Animals	
Species	FY 1968	FY 1978
Mice	22,772,300	13,413,813
Rats	6,131,000	4,358,766
Hamsters	785,900	368,934
Guinea Pigs	613,300	426,665
Rabbits	504,500	439,936
Dogs	262,000	183,063
Cats	99,300	54,908
Ungulates	106,200	144,352
Nonhuman Primates	57,700	30,323
TOTAL	33,402,700	19,876,076

(iii) Every year since 1972, the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture submits a report to Congress on the operation of the Animal Welfare Act. These reports contain information on the numbers of various types of animals (primates, rabbits, hamsters, guinea pigs, dogs and cats) used in registered laboratories. The figures vary between 1.6 million and 1.8 million but they do not provide any records of rats and mice. The Veterinary Extension Service at Rutgers University estimated laboratory animal use in 1971 as 63.5 million. Rodents (45 million) and frogs (15 million) made up the bulk of the total.

(iv) The Institute for Laboratory Animal Resources (5) conducted a survey of laboratory animal facilities in 1978 and reported the following figures for animal use. The 1978 figures are compared with those from the 1968 survey. The report states that 1,371 institutions sent in returns in 1968 and 1,252 sent in returns in 1978.

(v) In 1976, Dr. F. Homberger (6) estimated that 35 million mice, 6 million rats and 1 million hamsters were used annually in the pharmaceutical industry alone in the United States. In 1979, the National Cancer Institute (7) reported that they support research which utilizes approximately 6.5 million rodents every year.

(vi) Discussions with staff at major laboratory breeding establishments (e.g. Charles River) has produced the following information. Between 1965 and 1970 there was relatively little growth in the laboratory animal breeding industry. However, there was substantial growth between 1970 and 1975 and then the demand leveled off again. In 1979, the annual demand for rats and mice was estimated by a laboratory animal breeder to be around 20 and 50 million respectively. More recently, these figures have been disputed by another breeder and the annual totals were instead estimated to be 15 and 40 million.

(vii) A study by Foster D. Snell Inc. for the Manufacturing Chemist's Association in 1975 on the impact of the proposed Toxic Substances Control Act reported that, according to interviews with industry sources, approximately 35 million mice and 40 million rats are produced every year in the USA.

(5) Institute for Laboratory Animal Resources (1980) National survey of laboratory animal facilities and resources. U.S. Department of Health and Human Services (NIH Publ. No 80-2091), Washington, D.C.

(6) Homberger, F. (1976) In New Concepts in Safety Evaluation (Mehlman, M.A., Shapiro, E.R. & Blumenthal, H. eds), Chapter 3, Halsted Press.

(7) U.S. House of Representatives (1980) Hearings before a Subcommittee on the Committee on Appropriations, 96th Congress, 1st Session, Part 4 (NIH), pg 486. Washington, D.C.

c) The best estimate of animal numbers

The most recent ILAR Survey has been used to support the argument that there has been a substantial reduction in laboratory animal use. There probably has been some sort of reduction, but the survey figure of a total demand of 20 million animals is just not credible given all the other conflicting information.

(1) Laboratory animal breeders estimate total demand for rats and mice at approximately 60 million.

(2) The National Cancer Institute which provides approximately 10% of the total national biomedical research support, uses 6.5 million rodents by their own account. A reasonable extrapolation from these figures would indicate that 65 million rodents are used nationwide.

(3) Other reports, such as the Saunder's survey coupled with comments on the trends in laboratory animal breeding and the data given by Homberger indicate that laboratory animal use in the USA is substantial. Our best guestimates for total 1980 use are given in the table.

THE BEST ESTIMATE OF U.S. LABORATORY ANIMAL USE

	Low	High
Mice	40,000,000	50,000,000
Rats	10,000,000	18,000,000
Hamsters	600,000	1,400,000
Guinea Pigs	750,000	1,500,000
Rabbits	600,000	1,200,000
Dogs	250,000	450,000
Cats	75,000	125,000
Primates	30,000	35,000
Birds	1,000,000	3,000,000
Amphibians	3,000,000	5,000,000
Totals	56,305,000	80,710,000

While some of these animals are undoubtedly used in research which can be justified as legitimate, we contend that many others are being used in painful procedures which are unnecessary or inappropriate. As is abundantly clear, there is much room for disagreement but, for the moment, it should be possible to develop and obtain a broad consensus on the following points.

A. Vertebrate animals should not be used in biomedical research without good reason.

B. Every effort should be made to house laboratory animals in facilities which allow them to exercise their normal range of behavioral patterns, within reasonable limits.

C. If animals are used in research which is likely to cause pain, suffering, or distress, then EVERY REASONABLE effort should be made to reduce such pain, suffering and distress to a minimum.

D. In those circumstances where it is not going to be possible to reduce pain and suffering to levels which are relatively insignificant, there should be an increased requirement to justify the need for such research. That is, the (proposed) benefit to humans and animals must clearly outweigh the pain and suffering experienced by the experimental animals.

Sweden has adopted a formal system to subect those experiments which are likely to involve significant pain and suffering to much closer scrutiny by peer review committees. They have established six categories of animal research as follows: -

a) No pain involved, or not very painful (e.g. injections, blood-sampling, tube-feeding, dietary experiments, behavioral observations);

b) Anesthetized animals which are not permitted to revive, or animals killed painlessly (e.g. blood pressure studies, removal of organs or tissues);

c) Surgery under anesthetic from which the animal recovers, the surgery and/or procedure being of such a nature that there will be minimal post-operative pain (e.g. biopsies, transfusions, vascular experiments, pituitary removal);

d) As for (c) but with considerable post-operative pain (e.g. major surgical studies, burn studies, skin graphs);

e) Experiments on conscious animals which cause pain or experiments in which the animals are expected to become seriously ill and/or suffer pain (e.g. toxicity studies, radiation research, tumor transplants, stress and shock studies, behavioral studies involving aversive conditioning);

f) Experiments on unanesthetized animals which are paralyzed by curariform agents (e.g. some pharmacology studies).

It has been noted that the mere fact that research designs are being scrutinized has led to an improvement in research designs and the willingness of Swedish scientists to establish such self-regulation has engendered mutal respect and assistance between researchers and animal welfare societies. (8)

TOXICOLOGY TESTING AND SAFETY EVALUATION

Approximately 10-15% of all laboratory animals are used in toxicology testing programs. However, such programs are based on poor science and bureaucratic caution. They are also very expensive. A full scale toxicological evaluation would cost in excess of $1 million, even a modest test program could easily cost $100,000. Animal testing is one of the major reasons for these high costs and yet the use of mammals is a direct function of our ignorance not of our knowledge.

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(8) Ross, M.W. (1978) Australian Psychol. 13: 375-378.

In 1976, a group of toxicologists argued in a letter to Science (9) that faster and less costly procedures are urgently needed. Specifically, they stated that: -

> "a team of expert toxicologists and scientists from related fields should be assembled to evaluate existing technology and identify a battery of the most predicictive screening tests, including in vitro systems, animal models, and chemical behavior. A combination of quick tests could replace the conventional protocols, whereas any single test might not. This team could also perform cost-benefit analyses and estimate how much, if any, sacrifice of confidence would result from using a battery of screening tests at this time. *Use of a combination of screening tests might allow a tenfold reduction in cost and a fivefold reduction in time for toxicological testing. We would expect little or no sacrifice of safety,* since most of the tests tend to err on the side of false positives. Standard methods could still be employed if indicated by the screening results. (emphasis added). If a battery of screening tests were to be accepted, we would find the process of testing many thousands of chemicals a more manageable task. At present it looks pretty hopeless."

The development of such a battery of tests, resulting in tenfold cost reductions and fivefold reductions in time would require research and validation. This notion was strongly endorsed by a blue ribbon panel of Canadian toxicologists under the chairmanship of Dr. Gabriel Plaa. The panel noted that: - (10)

> "an increasing effort is necessary in the development of alternatives to the use of laboratory animals in toxicological testing. It is therefore recommended

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(9) Muul, I., Hegyeli, A.F., Dacre, J.C. & Woodward, G. (1976) Science 193: 834.

(10) Report of a workshop on alternatives to the use of laboratory animals in biomedical research and testing. (1980) Canadian Society for the Prevention of Cruelty to Animals, Montreal

> that the federal and provincial government departments and agencies and other organizations and foundations supporting toxicological research initiate and fund research programs with the *specific* objective of developing and validating non-animal models for use in the safety evaluation process."

Following the letter in Science by Muul and his colleagues, a toxicology Review Team was established by Tracor Jitco under
Development Command. In summarizing the finds of the Review Team, Henry (11) noted that "there can be no question of the urgency for development and validation of a battery of predicitive short-term tests; only the methods of implementation are in question." She might also have added that sufficient funds were not available and that there was widespread reluctance to commit any major effort to the search, either for a battery of predictive short-term tests or for suitable alternatives.

There are several examples of lost opportunities or reluctance to change from one approach to another.

(i) *Some ideas or opportunities have not been followed up because scientists lack a suitably prepared mind or the funding sources from which they could seek support.*

There have been many statements in the last few years that one cannot throw money at a problem but then the idea of alternatives lacked *any* financial support until the last year when the cosmetic industry started making substantial sums available. It was interesting to note how the availability of these funds helped to concentrate (prepare) the minds of some scientists who proposed various ideas for testing for irritants *in vitro*. Professor Joseph Leighton of the Medical College of Pennsylvania, for example, suggested following up on the knowledge that the chick embryo choriallantoic membrane expresses an inflammatory reaction to irritant materials. This phenomenon has been known to researchers since 1911 (12) but nobody has considered using this system in toxicity testing until now. The idea is very promising from a scientific viewpoint. In addition, the chorioallantoic membrane has no sensory nerve fibres and hence cannot sense pain.

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(11) Henry, M. (1979) Ann. N.Y. Acad. Sci. *369*: 131-136.

(12) Ross, R. & Murphy, J.B. (1911) J. Am. Med. Ass. *56*: 741.

(ii) *Some techniques have not been followed up because the developer has moved into other fields and nobody else has adopted the idea.*

In 1972, Flaxman (13) published a paper describing a system for the maintenance and growth of differentiated human skin *in vitro*. However, Flaxman decided to concentrate on his clinical practice and not continue his research and this system still awaits a committed champion to develop it further and apply it to practical testing problems.

(iii) *Some established tests can be replaced by non-animal systems or the numbers of animals required can be substantially reduced but bureaucratic inertia slows down or prevents such changes altogether.*

The story of polio vaccine development, production and testing contains several examples of this sort of thing (14).

For example, Dr. Walter Hennessen (15), a past president of the International Association for Biological Standardization has stated that "it seems remarkable that after the accumulation of much evidence by which experts recommended the abandonment of the monkey safety test", in polio vaccine production, the test is "still required unchanged by national control authorities."

Conclusion

The prospects for developing and applying alternatives to animals in toxicology testing are excellent. Not only will such systems replace animals altogether or reduce the numbers required, they could also help to change much toxicology from a rote performance of standard recipes to an actual science. The need now is to understand mechanisms and increasingly to correlate chemical structures with biological activity. The power of computers in this area, when provided with good and meaningful data, could be immense. Equally, cell culture techniques could be invaluable tools in toxicology. Such techniques, as they are developed and improved, will not only supplement animal studies, they will also be able to reduce considerably the number of animals required.

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(13) Flaxman, B.A. (1972) In vitro 8: 237-250.

(14) Rowan, A.N. (1981) Int. J. Study Animal Prob. 2: 37-43.

(15) Hennessen, W. (1980) Dev. Biol. Standard. 45: 163-173

Note: Additional details are provided in the complete testimony which is on file with the Subcommittee.

BIOMEDICAL RESEARCH

One of the underlying tenets of research is that one should only start on a project if one has a clear idea or theory that needs to be tested. Unfortunately too much science is either inadequately planned or employs an inappropriate research model. For example, according to Dr. James Will of the University of Wisconsin, almost half of a surveyed collection of papers on lung research used a model which was suboptimal or completely inappropriate This does not support the contention, often heard from biomedical researchers, that they would use an alternative, if available since almost half did not even use the appropriate animal model.

In addition, some research involves a great deal of suffering for only modest gain. In a recent paper on orthodontics research (16), the authors appeared to be more concerned about damage to the equipment than about the welfare of the animals. Four monkeys were restrained for as long as 205 days. In the words of the report, "throughout the active and retention phases of the experiment, the monkeys were kept in restraining chairs to reduce the possibility of damage to the appliances."

(16) Brandt, H.C. Shapiro, P.A. and Kokich, V.G. (1979) Am. J. Orthodontics 75: 301-317.

Examples of unwarranted or inappropriate activity using animals are provided in the detailed report which is on file with the Subcommittee. This includes examples of the use of dogs in cardiopulmonary resuscitation training, trivial uses of rats recommended in psychology texts, questions about the use of animals in psychology research, problems in the cancer research effort involving animals, poor management of primate research and a discussion of the concept of alternatives.

Conclusion

NIH has recently conducted a study (17) of the extent to which research funds are directed to animal research, to human research or to research involving neither of these two approaches (putative alternatives). For financial years 1977 - 1980, approximately 50% of NIH awarded dollars involved research on laboratory vertebrates, another 25% involved human research and the remainder was spread among projects using invertebrates, plants and micro-organisms. Approximately $1.34 billion was allocated to projects involving research on non-human vertebrates.

These figures by themselves do not address the issue of the development of new research models. It is clear that many non-mammalian systems are used in research but it is also clear from the previous sections that laboratory mammals are being used with little or no thought given to their suitability as research models or to their suffering. This is not to say that all animal research can be criticized in this way, but certainly some (too much) can. At this stage, we really do not know the true scale of the problem. We will certainly not elucidate this any further as long as the debate is left at the level of sweeping generalizations.

In this testimony, I have tried to come to grips with some of the issues by providing detailed examples. Admittedly these are mainly anecodotal in nature but they do indicate that a problem exists. All too often scientists, and the research establishment, respond to such evidence by arguing that, *in their laboratory or to their knowledge*, such abuses do not occur or are not widespread. Until recently, very few scientists have been prepared to address directly the problems which have been brought to their attention. As a result, the animal welfare movement has resorted to legislative and regulatory proposals as a last resort. These proposals are outlined in the final part of this testimony.

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(17) NIH Memorandum, Sept. 3, 1981, from the Staff Assistant to the Deupty Director, Division of Research Resources.

ALTERNATIVES, RESEARCH REGULATION AND CONSTRUCTIVE INITIATIVES

Introduction

Given that there are many areas of legitimate concern about inappropriate use of animals in laboratories, but also that some benefit is derived from animal research, how best can we resolve the issue of what constitutes "legitimate" animal research. Several bills have been introduced into Congress (H.R. 220, 556, 930, 2110 & 4406) and all of them have their advantages. However, there are two different approaches which need to be taken - one dealing with the question of alternatives and the promotion of such techniques and the other with regulation, oversight and the question of pain and suffering in animal research.

a) Regulation and Oversight

We believe that the Schroeder bill (H.R. 4406) provides an excellent first initiative on the issue of painful animal research and its regulation. However, we would like to suggest several changes to the text. These are as follows: -

(i) to page 7, line 4, add : "and two members of which shall be members of the public not connected with the institution. They shall be selected for their interest in and knowledge of animal welfare and care. It shall be unlawful for any member of an animal care committee to disclose any secret or confidential information obtained as a result of being on the committee and members shall sign any appropriate undertakings in this regard."

(ii) to page 7, line 20 add: "An individual working at a registered research facility has the right to notify appropriate authorities of abuses in animal care. All personnel must be given written notification of the right to this procedure."

(iii) to page 4, line 20 add: "If local anesthetics are used, the animal must be able to demonstrate behaviorally the presence of pain."

The main points of the bill are as follows. First, it would regulate the actual conduct of animal research for the first time. Some scientists may object because this would constitute unwarranted undermining of their academic freedom. We would counter that academic freedom will be unaffected, it is only academic licence that will be curtailed. Society already considers that animals should not be subjected to any sort of treatment and we see no reason why a scientist, supported by public funds, should be exempted form any sort of scrutiny at all. The argument that research is already reviewed cuts little ice since there are all too many examples in the published literature of inappropriate animal research. If animal research is reviewed, then the review process is defective. If it is not, then it should be and this should be backed by a statutory requirement.

This review process could easily be performed by an upgraded institutional animal care committee. The National Institutes of Health already require that all institutions receiving research grants should set up an animal care committee. In addition, several major institutions are now moving towards ethical review of applications for research grants. The University of Southern California has already established an ethics committee and others, such as the Veterinary School at Davis and George Washington University, are beginning to talk about it.

We feel that it is very important that these committees include some representatives from the local community who have credibility with local animal welfare societies. If this is not done, then the spectre of research being done in secret, behind closed doors, will continue to trouble the more active and vocal animal welfare protagonists in the community. Equally, it would be pointless to have someone who is trusted by the research scientists and not by animal welfare groups. Some middle ground must be reached so as to reduce the growing tension over animal research.

We also consider it to be vital that the committee and all its members not only understand their responsibilities but also that there should be some sort of legal undertaking that they will fulfill them. This could be in the form of a signed document, filed with the USDA, that all members understand and agree to meet their responsibilities. The individual (or individuals) who are the spokespersons for the animals (so to speak)should also be accessible to local animal welfare groups to answer queries and act as a liaison.

The issue of painful research and animal suffering is not going to be easy to address definitively in any legislation. While we do believe that any legislation must at least address the issue, we also believe that practical application of any "pain" clause will have to be left up to local animal care and ethical review committees. However, this does not mean that these committees must necessarily be left to devise their own guidelines which would inevitably differ greatly from one committee to another. As an example, one could use the system drawn up by the Swedish authorities (18) where animal research is divided into six categories (see table). Only research falling into categories four, five and six is subject to prior ethical review. It would not be difficult for USDA to establish a similar scheme, with appropriate examples.

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(18) Ross, M.W. (1978) Aust. Psychol. 13: 375-378.

Table Research Techniques, Pain and distress

	Categories	Examples
1)	No pain or only minimal & momentary pain.	Injections*, bloodsamples, tube-feeding*, diet experiments*, breeding studies, behavioral studies without aversive conditioning, routine procedures from small animal vet. practice.
2)	Animals painlessly killed or anesthetized animals not allowed to recover	Blood pressure studies, organ and tissue removal, studies on organ survival, perfusion experiments.
3)	Surgery on anesthetized animals with recovery but where post-operative pain will be minimal.	Biopsies, transfusion or vascular studies, cannulation, castration, pituitary removal in rodents using standard techniques, some CNS lesion.
4)	As above but with considerable post-operative pain.	Major surgical operations, burn studies, graft studies.
5)	Experiments planned on unanesthetized animals expected to become seriously ill from the treatment or to suffer considerable pain or distress.	Toxicity testing, radiation, transplants of tumors or infections, stress, shock or burn studies, behavior experiments involving aversive conditioning.
6)	Experiments on unanesthetized animals (or only local anesthesia) where the animal is curarized or paralyzed.	Some physiological or pharmacological studies on CNS.

* Some of these procedures may be preliminary to the type of result or research described in category 5. If this is the case, then the experiment must be classified in category 5.

Finally the Secretary of Agriculture must establish an advisory board of some sort to assist with the difficult issues that will undoubtedly arise. Decisions on where the line should be drawn when weighing possible human benefit against a certain amount of animal suffering will be difficult and will have to be made by a group composed of suitable skills and interests. Such an advisory board would have access to a wide range of views and would ensure that the Secretary received advice reflecting a reasonable balance of the conflicts in society-at-large.

b) Alternatives

The main problem with the "alternatives" concept is that most members of the scientific community are unenthusiastic about it. We believe that this lack of enthusiasm is due to several factors. First, scientists only hear about alternatives from the animal welfare movement and they have a built-in resistance to any ideas emanating from this source. (Scientists perceive animal welfare groups as accusing them of being cruel and unfeeling). Second, most scientists misunderstand the concept and its potential in advancing biomedical knowledge. When I can sit down and discuss the issue one-on-one, they will usually agree that more can be done and can even suggest possible avenues for research but, initially, they see the idea only as a wild claim that computers could replace animals. Third, Federal funding sources do not encourage scientists to think in this way, for all their verbal statements to the contrary.

The surprising element in all this, is that a great deal could be done to satisfy animal welfare concerns and, at the same time, advance the cause of biomedical research. It has already been noted that the development of new techniques, or research resources, is a necessary part in the advance of biomedical knowledge. One could thus establish a mechanism to conceive and promote new techniques - some of which obviously would be alternatives. In fact, the mission of the Division of Research Resources includes the need to conceive and support new resources. However, a 1976 review of the DRR mission (19) noted that DRR had not met its responsibilities in conceiving and creating new resources. Certainly, they had done very little to develop cell culture technology. The following minimal program of initiatives would make the concept of alternatives a more pressing matter for interested researchers.

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(19) Bolt, Beranek and Newman, Inc. (1976) Assuring the resources for biomedical research. NIH Publication No. 1-RR-6-2101, Washington, D.C.

First, NIH should establish a co-ordinating committee to act as a general oversight body to review the use of animals and progress made in alternatives. (The diabetes program could serve as a model). Such a committee must include members from outside the biomedical establishment who have knowledge of and a genuine interest in alternatives. If such persons are not included on the committee, then it will be perceived as an ineffective whitewash attempt.

Second, NIH must make funds available specifically for the development of alternatives techniques. In the present atmosphere, new money is not politically possible but one could certainly reallocate some of the funds available for Primate Research Centers or the anti-cancer agent screening program for example. These funds for alternatives should also include provision for training grants.

Third, some form of information clearing house dealing with all types of research techniques should be established. This clearing house should identify what is currently available so far as animal techniques and alternatives are concerned. This could be done through the preparation of critical reviews of methodology available for specific research areas. NIH supports similar initiatives in animal research (e.g. Current Primate References and Laboratory Primate Newsletter) but there is no reason why such programs should be limited to animal research or specific types of research models. A broader and comparative secondary information resource would undoubtedly be most helpful.

Fourth, the National Toxicology Program should establish a new listing of priorities which would place the development and validation of new methodologies at the top of its list. The criteria for the development of new methods should include animal suffering, as well as economic and human safety factors, in the cost-benefit equation. Each year, the annual report of the NTP should review progress in this area.

The above four initiatives would require a reallocation of a relatively small amount of resources but they would have wide-ranging impact. By accepting, in deed, rather than verbally, that the alternatives' concept has validity, the funding establishment would produce a radical change in outlook among research scientists via encouragement. rather than a threat of regulation. Utlimately, we believe the change will benefit science, human beings and animals. Current resistance to the above proposals is based more on fear of change and on a misunderstanding of some of the central demands being made by the humane movement.

Mr. **Walgren**. Thank you very much, Dr. Rowan.

We have the final witness, Dr. Barnes, with The Animal Protection Institute.

STATEMENT OF DR. DONALD BARNES

Mr. **Barnes**. Thank you for inviting me here today. It is Mr. Barnes, actually.

My name is Don Barnes and I am here with Animal Protection Institute. I represent myself, and hopefully all of the experimental animals, past, present, and future.

I have been a psychologist, I was a research psychologist, working for the U.S. School of Aerospace Medicine for 16 years. I blew the whistle. I was fired, reinstated, recommended that my job was no longer required, and quit.

Congressman Lantos mentioned a committee that had recently been set up at the School of Aerospace Medicine, Brooks Air Force Base. I was instrumental in helping to set up that committee prior to leaving the base. I actually think that it is set up as a token, just to have face validity. None of the recommendations that were made to that committee prior to my leaving some months ago have been implemented.

Funding is the important issue in the determination of research priorities. Protocol committees are controlled by the same individuals who make management decisions. Science is very often prostituted in this respect.

I ask you, how many of our younger and more up-to-date scientists, who are often junior officers in the military situation, for example, can defy their superiors without seriously threatening their careers and the livelihoods of their wives and children?

More outside evaluation is required in protocol and scientific committees. Programs which have been traditionally funded continue to be funded unless someone publicly objects. Does this ring a bell?

In yesterday's testimony we heard that programs are assumed viable unless they are singled out for some reason.

Almost every behavioral experiment in the United States requires suffering for the animal subject either through shocking the animal for not responding correctly or withholding food or liquid until the experimenter's expectations are reached.

I have participated in many peer reviews of proposed research defining both behavioral and psysiological parameters. I have never, not on a single occasion, heard the issue of suffering raised, although suffering was to be assumed in the majority of these experiments.

For example, anesthetics are never used in a behavioral experiment.

I submit to you that not one single behavioral experiment conducted by myself, my coworkers or my peers involved in similar research efforts has provided any insight into human behavior or has led to the discovery of any medical treatment to alleviate pain, prolong life or even to aid commanders in military decisionmaking.

As a scientist who had proven himself I was promoted into administrative positions, further and further from the laboratory, further and further from the monkeys' screams. I was so desensitized I never thought about the suffering of the experimental animal. He was a tool with which to accomplish a task. Nothing more.

As each experiment was published, parenthetically only 20 to 30 percent of the work accomplished at the institution I am so familiar with reached this stage, I automatically signed a statement saying that the provisions of the Animal Welfare Act were complied with. I never considered the implication of this statement, nor to my knowledge did my coworkers.

A recent study by Glantz in 1980 estimates that approximately one-half of the medical publications using statistics use them incorrectly. This is important. If less than one-half of the experiments are published, and this is a conservative estimate, and 50 percent of those are accomplished incorrectly, it is obvious that at best 75 percent of the experimental animals have been made to suffer and usually die, for nothing.

The statement was made yesterday that virtually all major medical advances have been made through the use of experimental animals. The testimony of others has challenged this contention with excellent documentation, but let us assume that the statement is true.

Now I ask you, if experimental animals are almost automatically used in medical experimentation, doesn't it follow that medical advances are necessarily going to be attributed to the use of animals?

There are two other points to be made here. One: Theoretically, we might be much further ahead if we had concentrated on alternatives rather than animals; and, two: Almost every serious misperception in medicine can be attributed to experiments utilizing experimental animals, demonstrating that this practice may in fact be detrimental to good medical research.

Finally, just because a protocol delineates a good experimental design and well-thought-out statistics and is in other important ways consistent with good science, justification for doing the experiment cannot be assumed.

I was convinced that much of the work I accomplished was good science before I evaluated the research from another angle, its utility. Even if my findings are 100 percent replicable the findings themselves are academic, there is no reasonable way to use them, they are worthless in any practical sense.

I do not like to offer problems without solutions, and I have six.

First: Insist upon good science.

Good science requires the scientist to know the history of his area, to be familiar with all the work previously done in that area and to consider the real world need for additional research.

Good science requires an impeccable scientific design so that the variable under investigation can be validly and reliably measured.

Good science requires ethical behavior throughout the experiment, without editing of data, which is prevalent.

Good science requires expertise in the application of proper statistics to the data; and, finally,

Good science demands that the results be interpreted in the most parsimonious fashion regardless of how colorless the conclusion may be. In many cases, colorless, may be a synonym for nonfundable.

Yesterday Dr. Raub mentioned the necessity for scientific freedom for the scientist. This sounds impressive, but in my opinion too many sins have been perpetuated in the name of science to this point. It is time to make scientists follow the scientific method. Insist on minimization of duplicity. Criticize unnecessary experimentation. Hold up a scientific standard which has fallen significantly.

We cannot be proud or confident of second-rate efforts. We have enough of that in other areas.

Two: Stop all behavioral research with live animals. I have had a lot of fun being a psychologist, but the childhood is over, and psychology, particularly behaviorism, has failed to provide the answers.

Look around us. People are no more emotionally healthy than they were before psychology was ever created as a discipline. I suspect they are less healthy as a result of cluttering up their thoughts with the language of psychology.

Tell me one study of behavior which has yielded important findings for man, and I may reconsider this point, but until you show me several such studies, let the animals go.

Three: I would love to think of the National Institutes of Health as a comforting and benign body of scientists dedicated to my well-being, but I cannot. I see a self-perpetuating bureaucracy that is probably almost incapable of introspection and change. But the NIH is the major user of laboratory animals, or at least it exercises more control over their use than any other agency.

I think Dr. Raub and his colleagues mean well in their efforts to advance medical science, even though I see them as being the victims of tunnel vision and bureaucratic insecurity, as was I. Even so, they are destined to decide the fate of most experimental animals in the United States, so I would charge them with yet more responsibility.

I request this committee consider removing laboratory animals from the Department of Defense and placing them in the care of the NIH. Whatever the DOD requires, they can request from the NIH where there is at least more controls and, I believe, more concern for the animals. Too often the Department of Defense justifies abuse on the grounds of national defense without having to be more specific for reasons of security. I will not condone by inaction further use of the laboratory animal for futile research for the military. Man wages war. Other animals do not.

My fourth point: Put money into a search for alternatives. Although many animal-using scientists argue that there is not enough qualified people to adequately use these moneys, let us be realistic. Put the rewards in a certain area and they will be found. Put incentive into finding and using alternatives.

My fifth recommendation: If it is determined that the present bureaucracy controlling medical science is impossibly unwieldy, create a center for alternative study. If the present system is not totally beyond redemption recommend changes to allow it to encourage and perpetuate the use of alternatives.

And my final point: Consider the cost, not only in terms of dollars, which, like beads and seashells, are ultimately unimportant. Consider the cost in human values and ultimate ecological harmony.

In closing, gentlemen, I contend that any system which allows even a single laboratory to function as Dr. Taub's laboratory in Silver Spring has functioned for years, is too great a cost for the advancement of human health. Treating animals badly is of greater cost to us than to the innocent ones being abused.

Thank you.

[The prepared statement of Donald Barnes follows:]

STATEMENT OF DONALD BARNES, CONSULTANT, THE ANIMAL PROTECTION INSTITUTE OF AMERICA

4 Oct 81

U.S. Rep. Doug Walgren
U.S. House of Representatives
Washington, D.C.

Dear Sir:

After 20 years as a scientist, 16 of which were spent training and irradiating non-human primates for U. S. Government projects in a futile attempt to predict man's performance in a radiation environment, I changed my mind. I "...called in 'well'...," (and never returned) to paraphrase Tom Robbins in his delightful book, Even Cowgirls Get The Blues.

The reversal of my committment to the laboratory animal as a model for the human being was not a tidy ideological and epistemological transition, but rather a painful step-by-step process of personal and theoretical confrontation which eventuated in my being here today. I'd like to briefly review that process with you while discussing alternatives to the use of laboratory animals and the pressing reasons for them.

Allen Bowd (Psychological Record, 1980. 30:201-210.) discusses the experimental psychologist's propensity to objectify the suffering of the laboratory animal, thereby neutralizing his own feeling of involvement, i.e., of responsibility to the animal. Allen Bowd is a perceptive fellow and he's absolutely right. It's not just the psychologist who adamently refuses to identify with the physical and emotional concomitants of pain however, it's the physician, the veterinarian, the laboratory administrative and technical staff, the reader of the report, in short, everyone who is (or should be) aware of the pain of another sentient being. For many years, I successfully avoided a confrontation with the ethical dilemma necessarily present in this situation by simply repressing its existance. The monkey was a tool, a model, a surrogate, a subject, an entity to be referred to in the third person, anything but what he obviously is, a living, breathing, thinking, feeling animal not too unlike the human animal.

Here, then, lies the crux of the vivisector's paradox, i.e., the animal is like us, therefore we can use him as a model of our function; however, the animal is not like us, therefore we can expose it to all manner of treatment and are not required to empathize with its suffering.

In retrospect, I am appalled at my inability to exercise independent and logical thought for such a long period of time, even in the face of widely-spaced (though intense) pangs of doubt in those relatively few situations where empathy could not be denied.

It may be that emotional repression leads readily to intellectual and scientific tunnel vision or vice versa; at any rate, I found a very high and positive correlation between these phenomena. I was privately questioning the ultimate utility of the data we were seeking almost from my initial exposure to the problem. I was, in fact, personally convinced of the scientific and practical futility of the project even as I sold similar projects to the funding agencies. I could do that because, once again, I excelled in the ability to pigeonhole these conflicting thoughts and actions, to fail to integrate, instead, to rationalize, to appease, to take the word of a higher-ranked though less knowledgeable individual.

And now we come to the immediate motives and actions of the scientist, who, like I did, continues to follow the scientific mirages conjured by his superiors to justify and, indeed, compound their importance in the overall scheme of things. We have arrived at the profit motive once again. Recognition, promotion, laboratory space, personnel, expansion plans, long-term projects, numbers of reports, speeches and publications, investment in expensive laboratory equipment and, more recently, additional heavy investment into primary, secondary, and tertiary computers to increase the sophistication of the analyses of the data (which, particularly in biomedical research, may well be incorrectly gained). These factors, and many others like them, tend to perpetuate and expand ongoing projects. Power is security; security is the sine qua non of the bureaucrat, so the old "don't rock the boat" phenomenon prevails.

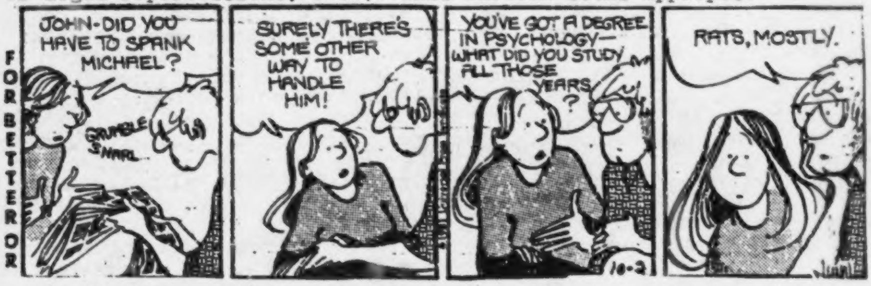
Let's now take our recipe for power and, hence, security, and add laboratory animals. A few rats? No problem! Add a dozen monkeys.... add space, add money, add personnel, add money, add space for the personnel, add money, add regulations, add money, add veterinarians, add money, add caretakers on a continuous basis, add money, add security personnel, add money and regulations, etc..... We've accomplished more than we're aware of! Permanence has just answered roll call. A proper holding facility (with a separate area for quarantine, another for surgery, etc.) is an expensive investment and must be considered in terms of long term utilization. Permanence spreads from structural to procedural blotting out alternatives as it goes.

Tradition makes an appearance (never to voluntarily depart) on the grouds of our new laboratory facility. The use of experimental animals is (with a kind of 'Catch 22' logic) justified by writing the regulations to include the necessity of their use, i.e., "The following products MUST be tested on animals prior to being released for human consumption:...", and the permanence of the facility is assured without proof of the validity of the assumptions underlying the entire project.

Some typical assumptions:

1. Any warm-blooded mammal is, if required to be, an adequate surrogate for man.

Laboratory rodents, for example, are cheap, hardy, breed easily, mature rapidly, learn adequately, are easily maintained, are not popular as cuddle-objects, share a poor reputation (disease carriers, vicious, etc.), so can be easily annihilated without guilt or legal repercussions, etc.,..This cartoon seems appropos:


FOR BETTER OR
JOHN-DID YOU HAVE TO SPANK MICHAEL?
GRUMBLE SNARL
SURELY THERE'S SOME OTHER WAY TO HANDLE HIM!
YOU'VE GOT A DEGREE IN PSYCHOLOGY— WHAT DID YOU STUDY ALL THOSE YEARS?
?
10-2
RATS, MOSTLY.

2. Non-human primates are the best models for human functions because they're phylogenetically closer to man.

But: Gorillas are not like Orangutans are not like Baboons are not like wild-captured male monkeys are not like cage born and reared male monkeys are not like cage born and reared female monkeys, etc., ad infinitum.

3. If a laboratory animal develops a tumor from being force-fed a preservative used in human food production, then humans will necessarily develop tumors also even though human tumors are histologically different from rat tumors and humans are never force-fed and the quantities ingested are significantly different and the stress factors are uncontrolled because they're not measureable, etc...Whew!

4. Biomedical science, like many physical sciences, is an exact science, e.g., we know which chemicals affect which physiological systems and to what extent. Further, the techniques and instrumentation used to measure such relationships are precise (valid) and reliable in that they are stable, i.e., relatively unaffected by that well-known Boojum of Biology, individual variability.

5. All biomedical scientists are expert in (a) Experimental design, (b) Existing or potential alternative techniques, (c) Biochemical integrative process - interactions between biological systems and subsystems, (d) Measurement of each specific parameter chosen for study, (e) Proper statistical treatment of data and the interpretation of results.

6. Most biomedical experiments are published.

Actually, I'd be surprised to find that as many as 40% were published. Further, "editing" of experimental findings is much more common than generally supposed as the clarity of the findings often determine their publishability and the number of publications is the most important variable in determining a scientist's status.

Unfortunately, I chose to follow the leader for many years rather than stop and determine the wisdom of doing so. In the early 70's (1973-74), I began to spend more time in the laboratory proper rather than in an office isolated from the animals. Up to that time, I had more or less aloofly directed the acquisition, training, radiation, data gathering and analysis, and report writing from an office far removed from the work itself. As I was successful in raising funds from agencies such such as the Defense Atomic Support Agency (DASA; now DNA, Defense Nuclear Agency), as well as through AF channels, I was receiving praise, promotions, the opportunity to travel, etc., and was at any given time, prepared to defend my program against all dissenters, whatever their reason for dissent. I considered animal welfare people as misguided individuals who just didn't understand the importance of our work, the need to "use" other animals for the sake of mankind. When people asked me what I did, I told them and included justification and rationalization at every opportunity. Strangely enough, in over 14 year, no one really challenged my wisdom! When new technicians were assigned to my unit and looked askance at the things they were expected to do to the animals I either convinced them of the necessity of doing this kind of research or saw that they were transferred out.

So I sat in my cozy office far from the screams of the monkeys (they were 'subjects' then), wrote scientific reports based upon the data which poured in from the radiation of over 1000 aniamals, set up field trips, handled staff problems, wrote justifications for additional funding, met in planning sessions with other administrators, and, in general, happily played the role of the scientist/principal investigator.

I entered another stage in the 1974-1979 time period, a stage of withdrawal, of lassitude, of unproductivity. No one cared, as long as I did what I was told, attended the required meetings on race relations, security briefings, weekly staff meetings, etc., came to work and left on time, kept myself readily available for whatever reasons, and, most important, didn't make waves. I could still be at my desk doing busy work and smiling at the boss, allowing my training to get staler and staler each year while concurrently losing interest in the entire business, but they went too far. In 1979, I was ordered to radiate (kill) 4 monkeys for an experiment which simply should never have been done. The entire professional staff within the branch agreed with my contention, now public, that the study could be easily accomplished without doing the experiment, i.e., we all knew the radiation dose was too small to effect a change in the learned behavior, the literature was clear on this dose effect, and, in any case, an experimental sample of 4 is inconclusive in every case.

After hearing the scientific rationale for choosing an alternate route to these data, Dr. Donald N. Farrer, my supervisor (who openly agreed it would be a negative experiment) told me, "My boss, Mr. John E. Pickering, has been apprised of all the reasons you have given. He maintains however, that such a study has been promised to SAC (Strategic Air Command) for some time and insists that it be done."

I filed charges of waste and mismanagement which were subsequently dismissed by another "Catch 22" maneuver, i.e., as long as 2 levels of management (Farrer & Pickering) agree to a decision, that decision is not a proper area for investigation by the Inspector General (IG). Shortly after this, I was fired. I contested their decision to fire me, won easily, and was reinstated in Nov of 1980. I spent the next 4 months doing research on alternatives to the use of laboratory animals, then completed a brief Staff Study assigned to me by Pickering (see Atch 1). Mr. Pickering and the laboratory (USAFSAM) commander, Col. Roy DeHart, had been plagued by letters from animal lovers and, correctly attributing these missives to my work in the humane movement, had agreed to order me back to irradiate more monkeys. My Staff Study recommends that behavioral work at the School of Aerospace Medicine be discontinued in favor of more definitive endeavors (NOTE! I did not recommend the cessation of all work with laboratory animals), I therefore had no choice but to follow my own recommendation, so I resigned. I must add that I was the only one who did, but I'm sure the Staff Study was less than widely circulated.

During those few months after reinstatement, my freedom was effectively curtailed by Mr. Pickering who was careful to deny me access to files of ongoing experiments and cautioned me not to roam around to other Divisions as my case had gained a degree of notoriety by this time, and he didn't want the other Division Chiefs to see me as a disruptive influence. I did, by dint of my own efforts, manage to become a member of a newly-formed committee established to determine alternatives to the use of laboratory aniamals. The committee was chaired by a Veterinarian, Dr. Douglas Obeck (DVM), who essentially turned it over to another Veterinarian, Dr. Dave Eisenbrandt (DVM, PhD Physiology). The other members of the committee were few: myself, Dr Richard Albanese (MD, Mathematician, Statistician), and Dr. Earl Jones (Veterinarian Pathologist). I enlisted a sixth member, Dr. Louis Blouse (PhD, Microbiology).

Attachments 2 & 3 to this document are Dr. Blouse's and Dr. Albanese's input to the committee for inclusion into a Committee Report (Atch 4) for the USAF Commander, Dr. Roy DeHart, Col., USAF. The reports were solicited and the Committee Report drawn while I was on annual leave attending the NIH-sponsored symposium on alternatives in Washington DC in February 1981.

Dr. Blouse's report is concise and requires no explanation; he has heard nothing further since it was submitted.

Dr. Albanese's report points to very important issues in the consideration of alternatives. One major alternative, he is saying, is to do good science. Be careful in the choice of biomedical parameters, making sure they can be adequately, i.e., validly and reliably, measured. Beyond this, Dr. Albanese shows that a huge percentage of published papers have serious methodological errors both in design and analysis. Every time such an experiment is completed, waste and suffering occurs.

As you will note, Dr. Albanese offers maximal support in assuring the quality of research accomplished at the USAF School of Aerospace Medicine. He is among the finest scientists I have ever met, perhaps the finest. Still, his report has occasioned no change in the review of protocols, in the very necessary educational processes in which scientists should be engaged, or in the amount of statistical consultation required by his staff. In short, policy makers are concerned more about total output than quality science. Scientists grow stale quickly in today's highly technological world. Few keep up with the many changes in their own discipline let alone take the time to become proficient in others, many of which are absolutely required in the accomplishment of good research. Degrees are not awarded in research, but in subject areas, many of which are highly specific. I cannot tell you how often I've watched a young physician, psychologist, physicist, veterinarian, etc...strugle to master the most simple techniques of the laboratory and then, too often, go ahead with a fourth-rate experimental design in order to meet a deadline imposed by administrators solely concerned with pleasing the funding agency.

Atch 4, as mentioned, is the Committee's report to the Commander and tends to move away from problem areas toward general research-oriented comments, even ending with an appended NSMR Bulletin. No matter. This document has had no effect on the policy of USAFSAM. In fact, poorly designed experiments with both monkeys and dogs are proliferating.

Atch 5 is included here as an example of a request for funding. It is titled, "Nuclear Weapons Effects Subtask Proposal for Efforts Funded by Headquarters, DNA." The title is consistent with the rest of the document in that catch phrases seem to be almost randomly thrown together to produce a "practical" or "operationally relevant" concept in the mind of the reader.

I wrote this document for several years, and then orally presented it to DNA personnel. The document is only slightly changed since I last worked with it in 1971-72, i.e., the requirements are based upon AFR 80-38, the need to define (operational) man's performance is still claimed although to my knowledge, no meaningful data toward this end have ever emerged from USAFSAM efforts and none, certainly, have ever been furnished DNA.

When I wrote the document, we referred to the FB-111, the B-52, and the B-1 (prior to its cancellation). It appears that each new weapons system gives this project increased visibility, i.e., mentioning the MX missile, the neutron bomb, and alluding to particle beam effects defines the author of this document as being aware of the newest in weapons systems. The reader is supposed to assume that biomedical research in support of these systems has made commensurate technological advances and is, in fact, tailored to the specific weapons system of interest. Nothing could be farther from the truth.

This document implies (pg 2, para 4) direct or indirect support for all AF operational Major Air Commands, i.e., SAC, TAC, and ADC (the author apparently does not know that ADC is no longer a major command). I can state unequivocally that neither SAC nor TAC utilizes data gained from radiated monkeys in their S/V analyses. Even AFWL (Air Force Weapons Laboratory) has no practical use for these data except to provide evidence that it exists and can be plugged into a computer program written to make unverified damage assessments given a hypothetical (nuclear) environment.

'This is how the funding is gained: The Aerospace Medical Division (AMD) and its parent organization, Air Force Systems Command (AFSC) compete for funds with operational (Real AF) commands. They have learned that funds are easier to come by if the work to be done is relevant to the Real AF, so they argue, "Man is an integral component of any AF weapons system. If AFWL is justified in doing S/V analyses on electronics and structures, S/V determination must also be made for man." Emissaries go forth to the Surgeons General of SAC and TAC and invariably, a junior officer (usually a Captain or a Major) with no experience in biomedical matters (degree in physics) has been given the responsibility of updating S/V data on operational and drawing-board systems. As he cannot deny that, for example, the B-1 bomber has a crew and that crew is vulnerable to radiation, he must agree that data defining man's vulnerability must be important to mission planners. AMD asks the Captain to send a TWX requesting this information so they (AMD) can transmit it and continue to gain more meaningful and practical data for continuing S/V updating.

The process usually breaks down here as most junior officers ask their seniors and are told to forget it as there's nothing that can be done to make man less vulnerable to radiation anyway. After all, that's what all the other S/V studies such as TREES (Transient Radiation Effects on Electronics) provided: a weapons system which will not fail before man does.

In 16 years of this research, I saw one TWX from SAC requesting such data; none ever arrived from TAC. Still, AMD never really required a real document from a using command to speak to their theoretical support of that command and to receive funding for such support so that exercise, just like the research itself, turned out to be academic anyway.

Atch 5 justifies its existence at least partially by stating the obvious, i.e., ionizing radiation is not good for man. Neither is an arrow in the chest or a flock of geese in the air intake of a jet engine.

Atch 5 proposes to do experiments using a device called the Primate Equilibrium Platform (PEP) which, they claim, simulates flight turbulence and operator control. I was the first person to train a monkey to operate the PEP -- in 1965. Over the years, I trained dozens of monkeys on this task and wrote all of the early "scientific" reports based on data gained from its use (wonder why they don't reference my work?). It does not simulate man's performance in any identifiable way. In fact, in 1979 and 1980, we did extensive work to show the relationship of monkey performance on the PEP to man's performance on a similar tracking task. There was little correlation, if any, and it was determined by Dr. Assa, Dr Samn, Dr Albanese, and SSgt Bachman that the monkey, in contrast to man, does not track linearally, i.e., does not "lead" the target, but responds to limits instead, producing an output response signal which cannot be compared to mans'. Now, Dr. Farrer is aware of this as is his boss, Mr. Pickering. As a matter of fact, Mr. Pickering was the last person to have the report of these major operator differences in his possession. Are these reports being stifled because the PEP is a major part of a large series of experiments (Antidotes for Nerve Agents) funded by the U.S. Army Biomedical Command? Or because the PEP has been used in DNA-funded experiments for 15-16 years and Pickering and Farrer cannot admit to its inadequacies? Both, I suspect. Take it from me, it's difficult to admit to yourself that you've turned out years and years of effort at the cost of millions of dollars and over a thousand animal's lives (not even to mention the hundreds of thousands of hours of suffering by the monkeys) for nothing.

I hate to say this, but the PEP never should have been used until its characteristics were known. Perhaps I'm responsible in part for the attitudes of researchers like Pickering and Farrer. But the point to be made here: we must know what we're measuring and exactly how to measure it before we subject a single laboratory animal to pain or death.

Atch 5, Section 8, discusses another task, the MART. The author states that the MART simulates an engine fire warning system and 4 fire extinguisher switches. Perhaps it does, to the author, but to the monkey, it's almost certainly a box with lights which must be touched when they come on to avoid a painful shock. It is apparently acceptable to put our concepts into the eyes of the monkey for funding reasons, even though we're ridiculed as being anthropomorphic if we attribute our feelings and values to him.

Atch 5, Section 8, discusses 2 experiments, a 2-phased one with monkeys which I accomplished in 1976 (Phase I), and 1979 (Phase II), and a study of radiation-induced emesis with dogs. The first experiment yielded very poor data which I refused to accept pending reanalysis (I was fired for this but reinstated upon furnishing proof of my allegations). The second phase of this experiment was done with only 4 monkeys and cannot even be called an experiment (this one triggered my charges against my bosses).

The canine experiment was done with house pets picked up by the pound. Of every size and shape and color and breed and disposition (though most were tail-wagging friendly), these dogs were fed, then drugged (or not), then irradiated. There was no non-irradiated control group. As the behavioral effects of these drugs are poorly known, particularly in combination with other drugs, they could probably not be used as antiemetics in an operational situation even if they were found to be efficacious in controlling radiation-induced emesis. At last count, 270 dogs were killed in this experiment.

I have chosen to punctuate my arguments for the seeking of viable alternatives to the use of laboratory animals in biomedical research by utilizing documentation from a single research laboratory, the United States Air Force School of Aerospace Medicine (USAFSAM), Brooks AFB, Tx. I did this for several reasons: (1) My comments are not supposition; I was there and know what's going on there, (2) I've pointed to only a few of the scientific infractions which exist in a single laboratory; I could fill an entire book on additional infractions within that one research facility which is seen by many as the showplace of biomedical research within the Department of Defense (DOD). There are hundreds of other laboratories in the U.S. which may be even more poorly operated, and (3) I hope to use this documentation to initiate a Congressional investigation of the USAFSAM. It is extremely difficult for a private citizen to be heard when he raises his voice against practices which have become traditional within powerful organizations; if there's any hope of influencing future biomedical research, in my opinion, it must be done methodically, laboratory by laboratory, perhaps even Division by Division, Branch by Branch, individual by individual. At any rate, I intend to make an impact upon biomedical research in this country as I firmly believe that "health" is not simply measured by a statistic like the number of cancer deaths per year but is a much much broader concept which must include respect for life itself above all other considerations. The philosophy that allows human beings to arbitrarily subject other sentient creatures to pain and death for the sake of mankind is no different than the justifications of early slaveowners or of the Nazi in his justification of the many experiments performed on Jews during WWII. The erosion of values, of respect for all life forms, is, I contend, a far worse condition for man than any physical disease.

Attachment 1

RZ/D. BARNES

Staff Study Report on Behavioral Research

PROBLEM

1. To determine meaningful alternatives to the use of experimental animals in performance decrement research in hazardous environments.

FACTORS BEARING ON THE PROBLEM

2. FACTS

   a. Official requirements for performance decrement research in hazardous environments have been formulated.

      (1) Criteria for estimation of force characteristics (health status of personnel) are vital to the accomplishment of DOD missions.

      (2) Medical protection of both military and civilian personnel must be assured in so far as possible.

   b. Ethical and regulatory considerations preclude the use of humans as subjects in hazardous research.

   c. Experimental animals are becoming more scarce and more expensive.

3. Assumptions.

   a. Hazardous environments of interest can be defined.

      (1) These environments can be reliably and accurately reproduced in the laboratory, and/or

      (2) These environments can be reliably and accurately estimated by theoretical and mathematical models.

   b. An experimental animal can be used as a valid surrogate for man.

   c. Knowledge of physiological effects of hazardous environments is insufficient as a predictor of performance decrement occasioned by exposure to that environment.

DISCUSSION

4. Risk - gain analyses may obviate Fact 2.b in some cases, e.g., the behavioral effects of Atropine have been tested in man and even

though data is limited, it is probably sufficient to yield more accurate predictions than could be gained by more indirect methods.

In considering Assumption a.: It is only theoretically possible to predict the degree of hazard present in any operational, i.e., militarily hostile, environment. First af all, we are not able to predict with accuracy the manner in which the enemy will deploy weapons, the type of weapon which will be used, or the number of weapons which will be brought to bear against any given target. We must therefore prepare against those contingencies which are theoretically more probable for any particular target. Even so, the variability surroundnng the deployment of any given weapon against any given environment, e.g., city, port, airfield, munitions depot, etc., prevents even the most sophisticated prediction system from making a confident estimate of the post-development environment. In veiw of this known variability which is inherent in the very definition of war, we must assume some gradation of weapon effectiveness and limit our predictions to those middle-ground situations where the degree of injury is weighed against the continued effectiveness of that injured unit as a military resource. In many cases, the importance of the targets may give us clues with which to grossly estimate the breadth of our injured but still militarily effective population. Even so, there will be no terminal validation of our predictions until long after the cessation of hostilities (if then). Given there is a modicum of truth in these assumptions, the question becomes, "Is it even possible, let alone feasible or cost-effective, to make meaningful predictions of hostile environments?"

A second question necessarily follows: Which criteria will be used to estimate potential military effectiveness? Physiological condition? Motivational indices of one kind or another? The availability of military equipment? Of water? Of strong leaders?

Assumption b. is usually invalid in the case of predicting performance decrement in man in a hazardous environment.

A better prediction of man's ability to function in a hostile environment is probably to be gained through an estimate (a measure) of general physical well being. This is simply an evaluation of the extent of injury and has been the main criterion of military preparedness during all wars. This evaluation will necessarily be made following exposure to a hostile environment. The use of an experimental animal in this respect will not aid the diagnostician, i.e., it is not necessary to break the bones of a nonhuman animal to predict that broken bones will affect the efficiency of the animal and, hence, of the human.

In light of the immense number of unpredictable variables which abound in a militarily-hostile environment, attempts to quantify biomedical effects beyond the grossest levels, i.e., sure-safe, sure-fail, is very probably academic at best, inordinately cost-ineffective, and, in the end, futile. Data suggest that the earliest observations made on human therapy and accident victims will have more predictive utility than any of the "more sophisticated" techniques of behavioral scientists of later years who have more than not, often forgotten the human in their feverish search for new and different species of animals to expose to hostile environments.

CONCLUSION

7. Enough data is presently available to make the damage assessment decisions which will be required in the aftermath of military confrontation.

The development of antidotal and/or therapeutic preparations or techniques is, the first-line duty of the medical and biomedical professions. If an antidote for organophosphate poisoning, for example, is required to protect or treat our people, then it must be developed as quickly as possible. One does not, however, test the speed or roadability of an auto with a broken driveshaft - first one repairs the driveshaft while insuring that the problem which caused it to break in the first place no longer exists; then one can indulge in the luxury of determining its performance characteristics.

ACTION RECOMMENDED

8. a. Cease behavioral research both inhouse and contractual.

b. Convert 2675B (research psychologist) slots to positions for research biochemists or physiologists in order to gain accurate measurements of the integral components of biological systems to be used as a data base.

c. Set up an active research program to determine the mechanisms of injury from the hazards of interest to the USAF.

d. Develop whatever prophalactic and/or therapeutic agents and techniques are required to protect against or reverse the effects of such hazards using in vitro methods wherever possible.

e. Encourage investigators to utilize and develop alternatives to the costly (both monetarily and ethically) use of in vivo preparations.

Attachment 2

DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235

REPLY TO ATTN OF: EKB

28 Jan 81

SUBJECT: Alternatives to Animal Use

TO: RZ (Mr Don Barns)

I have reviewed the comments of Dr Albanese and others regarding alternatives to the use of animals in research at USAFSAM. It may be possible to reduce the need for experimental animals or minimize the numbers required through the use of cultured cells or organs. In many instances, mammalian cells can be substituted for animals in doing quantitative assays of viral suspensions (PFUs, $TCID_{50}$ instead of LD_{50}). Bacterial cells are being used successfully to test for mutagenicity. Examples of specific uses of cells are given below. Each of these was accomplished at one time using whole animals; some still are.

1. Adherence, adsorption, penetration of infectious agents (virus or bacteria) to cells or membranes.
2. Propagation of virus
3. Assay of virus
4. Viral antibody assay (clinical, commercial, reagents)
5. Interferon preparation (in cells first and now by bacteria as a result of recombinant DNA technology)
6. Mutagenicity (Ames, using bacteria)
7. Viral isolation from clinical or other sources
8. Assay of antiviral agents
9. Chemical and drug toxicity
10. Genetic studies
11. Infectivity spectrum of viral agents
12. Radiation effects
13. Cancer studies, cell transformation
14. Production, testing of defective viruses
15. Viral pathogenesis (also other intracellular agents)
16. Bacterial toxicity assay (cholera)
17. Organ culture - tracheal rings (ciliary activity, mucous flow)
    - intestinal segments

Cells are usually less expensive than animals and more readily available. They are simpler and "cleaner." By using cells, the investigator can reduce the number of confounding variables in the test system.

In order to achieve the maximal usage of cells to replace animals at USAFSAM, each experimental protocol could be evaluated to insure that cells are specified where their use is possible. I am confident that a working arrangement could be made with the Epidemiology Division to provide this consultative support.

Louis E. Blouse Jr.
LOUIS E. BLOUSE, JR., Ph.D.
Chief, Microbiology Branch

Attachment 3

DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235

REPLY TO ATTN OF: BRM (Dr. Albanese)

SUBJECT: Alternatives to Animal Use

TO: USAFSAM/VSP (Maj David L. Eisenbrandt)

1. Biomathematical/Biostatistical methods have clearly demonstrated their ability to enhance biomedical research efficiency by increasing the information yield from each animal used through better experimental design and improved analysis of experimental data (Ref #1). For example, a new statistical method for cancer testing reduces the animal requirement from 600 to 180 animals (Ref #2). However, the use of animals cannot be eliminated entirely. Quality biomedical data are always needed as model input variables and for model tests (ref #1). Following this line of thought, in reference #1 a need is outlined for:

(a) education of biomedical researchers concerning how mathematical sciences can be used in their research, and,

(b) more biomathematicians to serve biomedical researchers.

2. Experimental design and statistical analysis errors are excessively common in the biomedical literature. By studying a sample of medical articles in very reputable journals, Glantz has estimated that approximately half the medical articles using statistics use them incorrectly (Ref #3). The cost of this incorrect experimental design and analysis is erroneous inference and waste of research subjects and other resources. Glantz indicates the need for more careful experimental design and more complete definition of statistical methods in the protocol approval process, and points out that it is difficult to detect errors by reading completed papers. The error rate in USAFSAM work is certainly not this high, particularly when the Data Sciences Division has been engaged on the effort. However, most USAFSAM in-house and contract protocols have a very limited design and analysis section so that errors can be easily overlooked during the Data Sciences Division review, and a similar situation exists with completed papers. There is currently no review of protocols or reports for alternatives by the Biomathematics Modeling Branch of the Data Sciences Division.

3. Understanding biological or medical problems ultimately rests on understanding the basic physical mechanisms underlying the problem. Mathematical modeling commonly exploits these mechanisms to sharpen experimental design and analysis. While techniques for performing physical measurements in biological materials or subjects are advanced, biomedical researchers are frequently inadequately aware of the techniques and their application. Important comments by Schwann are:

> "Presently hardly more than a handful of scientists are competent to do quality work in the area of the physical properties of biological systems, and it is a source of frustration to me to

> frequently see work published which deals with physical properties in an inadequate and often erroneous manner. One of the principal reasons for this situation is the popularity of the bioproblem-oriented scientist. Gaining a good knowledge of the physical properties of biological systems in itself is not considered a significant biological achievement. But as the problem-oriented scientist recognizes the need for such knowledge, he attempts to gain such knowledge inadequately, since he is not appropriately trained and experienced. A waste of time and money result (Ref #4)."
>
> "Having a concise description of measured structural properties in the form of a model greatly facilitates application of the acquired knowledge to a host of applications in biological research and clinical practice. However, one has to be careful in evaluating respective merits of mathematical and physical models. A great deal of mathematical modeling is done these days with but little physical insight. This type of modeling is usually not very fruitful. A mathematical model has to be based on a properly chosen physical one in order to provide for predictive power and understanding. Without this base it tends to be only a sophisticated form of curve fitting. A greater understanding of the related merits of mathematical and physical modeling is needed and should be part of the training of biomedical engineers and physicists.(Ref #4)."

4. The Biomathematics Modeling Branch of the Data Sciences Division has seen growth in its research effort during the past seven years as indicated in Table I. For the past three years this branch has provided formal annual reports to the Commander and USAFSAM Division Chiefs to ensure that highest priority work is addressed by the group. However, as mentioned above, except for the work the branch pursues itself, it has not been involved in protocol review or report evaluation.

5. Biomathematical modeling is a discipline that has been made possible by the advent of the digital computer. Of 26 journals referenced by the Biomathematics Modeling Branch, 21 were founded after 1950, and 15 after 1960. A list of these journals which are specifically devoted to modeling is provided as Table II. Of course there are many other journals that print modeling reports, but modeling is not a central element in their focus.

6. Summarizing the above discussion, several approaches to alternatives to animal use emerge:

(a) USAFSAM in-house and contract protocols can be required to contain complete pictures of intended experimental design and analysis with reference to and evaluation of alternatives. The level of detail needed for a proper judgement can be unambiguously defined and incorporated into a policy statement. A personal communication from Dr. Carole Newton, author in reference #1, indicated that complete design and analysis protocols are now an important feature of NIH grant proposals.

(b) The Biomathematics Modeling Branch can be used to review protocols from the point of view of modeling alternatives.

(c) Experimental design, mathematical and statistical modeling material and education can be provided USAFSAM experimenters in a short course or seminar format.

(d) Protocols may profitably be reviewed by an advanced instrumentation panel made up of selected USAFSAM bioengineers and physicists to determine adequacy of measurement methods.

Richard A. Albanese, MD.

Richard A. Albanese, M.D.
Chief, Biomathematics Modeling Branch

TABLE I
BIOMATHEMATICS MODELING BRANCH

YEAR	RESEARCH CIVILIANS	RESEARCH OFFICERS	RESEARCH VISITORS	TECH SUPPORT/ PROGRAMMERS	TOTAL PERSONNEL	IN HOUSE WORKUNITS	CONTRACT WORKUNITS
1974	5	0	0	0	5	0	0
1975	6	0	0	0	6	0	0
1976	6	0	0	0	6	0	0
1977	7	0	0	2	9	0	0
1978	5	1	3*	3	12	3	4
1979	5	1	3*	3**	12	3	4
1980	5	1	3*	5***	14	5	5
1981	5	1	1****	5***	12	3	6

* Includes one Intergovernmental Personnel Act Visitor, one AFOSR University Resident, and one NRC Fellow.

**** Includes one AFOSR University Resident

** Includes one GSA contractor.

*** Includes one GSA contractor and one enlisted overage.

TABLE II

Journals Relevant to Mathematical Modeling and Date of Founding

Biometrika 1901
Econometrica 1933
Psychometrica 1936
Bulletin of Mathematical Biology 1939
Biometrics 1945
Man-Machine Systems, IEEE Transactions on Systems, Man, and Cybernetics 1952
IEEE Transactions on Biomedical Engineering 1954
Management Science 1954
Physics in Medicine and Biology 1956
Human Factors 1958
Biophysical Journal 1960
Journal of Theoretical Biology 1961
Biological Cybernetics 1961
Journal of Mathematical Psychology 1964
Journal of Financial and Quantitative Analysis 1966
Computers and Biomedical Research 1966
Mathematical Biosciences 1967
Biomedical Engineering 1967 (USSR)
Computer Programs in Biomedicine 1970
Computers in Biology and Medicine 1970
Theoretical Population Biology 1970
Computer Medicine 1971
Journal of Mathematical Sociology 1971
Journal of Biological Physics 1973
Journal of Mathematical Economics 1974
Computers and Management 1975

REFERENCES

1. The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing. National Academy of Sciences, Washington, D.C. 1977. Carole Newton has key article on modeling.

2. Robert M. Elashoff and Stuart Beal. Two-Stage Screening Designs Applied to Chemical-Screening Problems with Binary Data. Annu. Rev. Biophysics. Bioeng. 5:561-587.

3. Stanton A. Glantz. Biostatistics: How to Detect, Correct and Prevent Errors in the Medical Literature. Circulation, Vol 61, No 1, 1980, pg 1.

4. Herman P. Schwann. Physical Properties of Biological Systems. IN: Future Goals of Engineering in Biology and Medicine, edited by James F. Dickson, III, and J.H.U. Brown, Academic Press, New York, 1969.

Attachment 4

REPORT OF THE REPLACEMENT ANIMAL MODELS COMMITTEE

Problems:

1. Some species of animals may not be available for research or the cost of certain species may be prohibitive.

2. Inappropriate numbers (too few or too many) of animals may be used in experiments.

3. Inappropriate species of laboratory animals may be used in experiments.

Goals:

Reduce or replace laboratory animals in biomedical research, testing and education. Also, use species of the lowest possible evolutionary category.

Recommendations:

1. Increase investigator knowledge and awareness of replacement animal models, biomathematics modeling and statistical methods.

a. Periodic newsletters should be sent to SAM investigators, administrators and technicians.

b. The library should make available books, journals, abstracts and other literature on these subjects (see atch 1).

2. Protocol content should be expanded.

a. Require investigators to indicate that they have explored possible replacements for laboratory animals (see atchs 2 and 3). Appropriate literature should be cited in the protocol references.

b. Require more detailed experimental design statement. The minimum standards for an experimental design should be more clearly defined and in conformity with NIH and NSF requirements.

c. Require a detailed statement of statistical methods including data acquisition, processing and inference procedures.

3. The review of protocols by Data Sciences should be detailed and comprehensive.

a. Insure that the applications of biomathematics modeling have been considered as replacements for, or augmentation of, animal use relative to the goals of the proposed scientific effort (see atch 4). The cost effectiveness of such models should be estimated.

b. The experimental design, statistical analysis and sample size should be optimally efficient and relative to the goals of the proposed research.

4. Strengthen protocols as scientific review documents. Each SAM investigative division should have a protocol review committee which considers the scientific merit, design, species of animals and alternatives of the research.

5. The Animal Use Committee should be expanded to include a permanent member who has the responsibility for replacement animal model applications in SAM research.

a. Review protocols and make recommendations on appropriate replacement animal models.

b. Coordinate sources of information and expertise on replacement animal models.

Adverse Effects:

Biomathematical modeling and computer applications may be more expensive and time consuming than animal experimentation. In vitro techniques such as tissue culture and organ culture also are expensive and time consuming. Additional time may be required to prepare and review protocols because of attention to replacement animal models.

Conclusions:

Many scientists already use worthwhile alternatives to animals when possible (see atch 5). However, the clinical and applied research which predominate at SAM reduces the opportunities to use in vitro models as replacements for animals. On the other hand, education of SAM investigators as to alternatives would increase awareness and may promote utilization of alternative methods and techniques. More extensive use of biomathematical modeling, better experimental design and diligent statistical analysis may reduce the use of animals in SAM research.

SELECTED LITERATURE ON REPLACEMENT ANIMAL MODELS

Rowan, Andrew N., "Alternatives to Laboratory Animals, Definition and Discussion". The Institute for the Study of Animal Problems, Washington, DC, 1979.

Rowan, Andrew N., "Alternatives to Laboratory Animals in Biomedical Programmes", Animal Studies 1;103-128, 1977.

Rowan, Andrew N and Stratmann, Carl J eds. *The Use of Alternatives in Drug Research.* University Park Press, Baltimore, MD, 1980.

ATLA Abstracts, FRAME, 312a Worple Rd, London SW 20 8QU, United Kingdom

Smyth, D H, Alternatives to *Animal Experiments*, Scolar Press, London, U K, 1978.

References relevant to mathematical modeling are listed atch 4.

EXAMPLE OF REPLACEMENT ANIMAL MODELS

Cell Culture

Tissue Culture

Organ Culture

Unicellular Systems (bacteria, protozoa)

Biochemical assays including clinical pathology

Mathematical Models

Computer Systems

Anthropomorphic (man-like) dummies

Simulated Tissues

Attachment 5

NUCLEAR WEAPONS EFFECTS SUBTASK PROPOSAL

FOR EFFORTS FUNDED BY HEADQUARTERS, DNA

1. DNA SUBTASK CODE AND TITLE AND APPLICABLE FY. U99QAXMJ601, Performance Decrement for Specific Threat Scenarios, FY 82-86.

2. AGENCY HAVING TECHNICAL SUPERVISION. The Aerospace Medical Division will manage this effort. USAFSAM (USAFSAM/RZ) will exercise direct technical supervision.

3. AGENCY PERFORMING WORK. USAFSAM. MIPR NUMBER 80-0009. The project officer is:

FY 80 (Prior FY)	Dr. Donald N. Farrer, GS-15 USAF School of Aerospace Medicine (RZ) Brooks AFB TX 78235 Telephone: AC 512-536-3881 Autovon: 240-3881
FY 81 (Current)	Same as above
FY 82 (Planning)	Same as above
FY 83	Same as above

4. SUBTASK PROPOSAL RESOURCE REQUIREMENTS.

See Next Page.

5. ESTIMATED COMPLETION DATE. This task is to provide continuing technology advances necessary for the accomplishment of crew vulnerability analyses. The scope of the work requires a five-year effort and is subject to continual reevaluation based on new weapons employment and specific threat-performance requirements. Definitive results for specific objectives will be achieved within each fiscal year program.

6. REQUIREMENT AND JUSTIFICATION. As a crew member of modern strategic or tactical aircraft, man may be exposed to prompt radiation from any yield weapon. The effects of ionizing radiation (e.g., nausea, vomiting, blood pressure drop, muscle fatigue, exhaustion) can seriously degrade aircrew performance. Performance impairment is a complex function of radiation exposure levels, time following exposure, time into the mission, and mission task complexity. Data relating to the effects of nuclear radiation upon man's ability to perform are critical to mission planning, systems design, and for the development of techniques to ameliorate these effects.

Both defensive and offensive manned weapons systems have become increasingly complex in response to specific (stringent) operational requirements. The flexibility offered by man's presence in a weapons system is assured only insofar as man remains a viable link in the control of that system.

The major goal of this research is to determine man's vulnerability in a nuclear environment while functioning as an integral subsystem in an operational weapons system, and further, to investigate certain means of increasing his tolerance to specific nuclear threat environments.

Crew vulnerability assessment for present and proposed systems is requested from AMD by the Air Force Weapons Laboratory (AFWL), Operational Commands, and Program Offices (PO) and BMO/MX. AFWL integrates information on human vulnerability and performance degradation (e.g., crew vulnerability assessment for the B-52) into the overall manned aeronautical systems S/V analyses. AFWL-coordinated interactions with using commands, such as SAC, TAC and ADC, are frequent in the total analytic effort, and the results can impact planning as well as system design and construction, and retrofitting (e.g., compatible hardening criteria, automation, and/or system redundancy). One proposal for the MX concerns the air mobile concept in which a transport aircraft would be required to deliver a missile or crew to a remote site from which a missile would be launched, perhaps within hours of arrival.

Nuclear weapons radiation produces a wide range in the ratio of gamma rays to neutrons. Previous studies with varying sources indicate a wide variability in the effectiveness of neutrons in producing a measurable effect which depends on the tissue observed and the definition of the endpoint. To date, the effect of a neutron-rich environment in producing emesis appears similar to a gamma-rich environment, although the damage mechanism appears to be different. Additional studies of the nature of emesis induction by neutrons are necessary.

The prevention or amelioration of radiation-induced emesis is a major concern to all combat commanders and has resulted in firm requirements for the development of antiemetic drugs which are not contraindicated for aircrew personnel. Effective drugs have been identified which ameliorate emesis, and further work to enhance protection is planned.

The BMO (MX Office) and HQ SAC (S/V Office) have written requirements for specific experimental information on crew performance following radiation exposures. Efforts to meet these requirements are directed toward identifying performance decrements for aircrew personnel as well as ground support personnel. Measures of reaction time capability are also required. Allowable wartime emergency dose limits are required for maintenance and repair of nuclear attack effects on military installations.

The same offices request data on emetic effects of radiation decrements expected during acute radiation effects, and possible methods of ameliorating the first stage radiation effects.

The significance of nuclear radiation exposures at altitude are considerably different than ground detonations. Several transport codes have been devised and should be translated into usable data depicting the radiation threat at high operational altitudes. New systems or new uses of existing systems are continually emerging on the scene as possible weapons systems. The enhanced radiation weapon further modifies weapons effects and requires additional data as to its damage characteristics. Another new weapons threat is the particle beam for which we have devised an initial project to depict its capabilities in producing effects on biological systems.

Specific requirements from HQ SAC entail USAFSAM support in the area of crew S/V for weapons systems. This continuing effort entails detailed analysis of the aircraft flight characteristics, the performance of the crew members, e.g., crew tasks and timeliness, and the performance decrement by time predicted in the event of nuclear radiation.

This proposal supports requirements as outlined in the "Nuclear Weapons Effects Requirements" document. Specifically, this proposal supports the Biomedical Effects in Experimental S/V Assessment, and requirements in AFR 80-38.

7. BRIEF OF PROPOSED OBJECTIVES. Predictions of aircrew performance capability in nuclear war scenarios based on performance decrements studies; neutron effects; antiemetic drug efficacy; and particle beam effects.

a. Technical Objectives. Four technical objectives are proposed for this subtask. First, tests of performance decrements to specific SAC/TAC/MX mission scenario radiation profiles will be conducted. Second, emetic effects of neutron radiation and determinations of antiemetic drug efficacy will be accomplished for neutron and gamma radiation exposures. Third, determinations of particle beam effects on biological systems. Fourth, the 24-hour delayed effects of neutrons will be studied with respect to performance decrement for applicability to NATO requirements. Knowledge of nuclear radiation levels at altitude is necessary to accomplish the first two objectives.

b. Approach. For the first subobjective, trained primates will be exposed to a GODIVA reactor in pulsed mode and tested for performance decrement during a 48- or 72-hour period. This time lag following radiation is of interest both to MX and SAC planners. The second subobjective is being studied using canines to determine neutron effectiveness in producing emetic behavior.

Many subjects have been utilized in determining drugs effective in reducing the emetic affects of gamma radiation. However, initial observations are that these drugs are not nearly as effective in reducing neutron induced emetic responses. Work is continuing to determine the cause of this variation. The third subobjective is being accomplished initially in a contractual effort at the energy source using rodents as the experimental subjects.

8. PROGRESS TO DATE: A large scenario study has been accomplished in two phases. The scenario is an aircrew required to escape a local radiation environment and penetrate enemy territory in the face of additional radiation exposure. Task specific performance decrement is examined. Two radiation levels are studied; 1440 rad (Phase I) and 360 rad (Phase II). Both phases utilized the Primate Equilibrium Platform (PEP) task which simulates aircraft control in turbulence and the Multiple Avoidance Reaction Time (MART) task which simulates an engine fire warning system and four fire extinguisher switches. This work will be available as a SAM TR early in 1981.

Utilizing gamma radiation and random source dogs, drug effectiveness of thiethylperizine (antiemetic), promethizine (H_1 antihistamine), and cimetidine (H_2 antihistamine) has been determined in all combinations. The 50% radiation level to produce emesis (ED_{50}) in untreated dogs is 256 rad. All three drugs in combination raised the ED_{50} level to 484 rad. Other random source dogs exposed to TRIGA Reactor neutrons had an ED_{50} of about 420 rad. When administered the three drug combination prior to exposure, that groups' ED_{50} dropped to 387 rad.

9. RELATED SUBTASKS: U99QAXMH202 - Nuclear Radiation Induced Performance Decrements.

10. FUTURE PLANS: Additional scenario studies are planned in which the role of SAC and MX personnel in nuclear encounters is examined. Considerations of tasks necessary for Air Launch and Ground Launch Cruise Missiles will also be made. Additional studies in antiemetic agents include exposure of the CNS to test a theory that CNS irradiation increases the threshold of neurotransmission in the CTZ, thereby reducing the effect of treatment which is also designed for that effect. SAC requests information pertaining to the effectiveness of drug treatment following irradiation.

Further information of particle beam effects may be necessary based on the findings of this first work now in progress.

PROGRAM PROPOSAL RESOURCE REQUIREMENT
(In $1,000)

Submitting Organization: USAFSAM/RZ, Brooks AFB TX

TASK CODE/ U99QAXMJ601
Title: Performance Decrement for Specific Threat Scenarios

PROGRAM YEAR	OBLIGATION CATEGORY	TOTAL RESOURCE REQUIREMENT				CIVILIAN PERSONNEL RESOURCE/MANYEAR REQUIREMENT*						
							IN-HOUSE		CONTRACTOR		OTHER GOV'T	
		TOTAL	IN-HOUSE	CONTRACTOR	OTHER GOV'T	TOTAL	COSTS	MAN YEARS	COSTS	MAN YEARS	COSTS	MAN YEARS
PRIOR:												
FY 80	ACTUAL	50	50				23	.8				
CURRENT:												
FY 81	PROGRAM	50	50				25	.8				
BUDGET:												
FY 82	PLANNED	50	50				25	.75				
PLANNING:												
FY 83	PLAN	50	50				26	.75				
FY 84	PLAN											
FY 85	PLAN											
FY 86	PLAN											
FY 87	PLAN											
TOTAL COST TO COMPLETION												

* Costs included in TOTAL RESOURCE REQUIREMENT

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Mr. **Walgren**. Thank you very much, Mr. Barnes.

Mr. Brown?

Mr. **Brown**. No questions.

Mr. **Walgren**. Mr. Weber?

Mr. **Weber**. No questions.

Mr. **Walgren**. Let me just ask, I wanted to go back to the percentage of NIH research that is now involved in alternatives, and as I understand it, the use of alternatives is increasing, is that correct?

Ms. **Peretsman**. I would expect so. I don't have figures to support that.

Mr. **Walgren**. The question is, how can we both encourage them to pursue the alternatives, and yet not direct so much of the money toward alternatives that we undercut present research?

If we were to direct 30 percent or 40 percent toward alternatives, does that undercut the present valid research?

Ms. **Peretsman**. Well, I would think not, because most research grants are funded on a yearly or 3-year basis, and because of the great interest now in the various areas of nonanimal-using research such as DNA and the monoclonal antibody work and others. I think there will be an increasing number of scientists interested in going into this area, as new research money becomes available. As old grants expire the agencies will probably find many more proposals asking for research money in these nonanimal-using areas, and I think that the phase-over will come quite naturally with the growth of interest in these areas of science.

Mr. **Walgren**. When you say you feel it will come naturally does that mean that we should not set a specific percentage for the alternative effort?

Ms. **Peretsman**. We would like to see the amount of funds increased because we are a humane organization, and we feel that this is the most direct avenue for the removal of animals from the laboratory, that is, having other types of research and testing done. And additional Federal research expenditures, as was pointed out, does increase the amount of interest in these areas. So that you would have more scientific thought, and as a result perhaps more good research proposals.

Mr. **Walgren**. Two ways to emphasize that would be to designate Federal funds to engage in original research designed to develop alternative tests, and also to require a certain percentage or a certain amount of present testing to use presently existing alternative tests. You are urging a major commitment in the first area in particular, is that correct?

Ms. **Peretsman**. We would like to see an extension of the second area, too, but it would require an acceptance by the regulatory agencies and by the commercial manufacturers of these various products which must be tested, of the validity of these tests.

Mr. **Walgren**. Conceivably you could have a sliding scale which would take into account the amount of alternative testing that is now being done in NIH and that would keep pace as it grew and encourage more.

Ms. **Peretsman**. Yes, that would be one possibility.

Mr. **Walgren**. Any other reactions from the panelists?

Dr. **Rowan**. Yes, Mr. Chairman.

I would just like to mention that in toxicology testing and safety evaluation you have really large numbers of animals being used, somewhere, anywhere between 15 and 25 million every year, and I think that you could probably reduce those numbers by at least 75 percent without sacrificing any human health or safety.

Regulatory requirements under TOSCA, FIFRA, and the Food and Drug Act require animal testing, if not explicitly, certainly implicitly. Some of these tests are unnecessary and some of them use animals in a way for which the answers would not be applicable to human beings. It has been shown in a recent Brookings Institution study that regulatory requirements are based on politics rather than good science.

What we would like to see is that some of these regulatory requirements are based on good science rather than pure political motivations, especially because so many animals are being used in callous ways.

Mr. **Walgren**. Yes.

Mr. **Spira**. I earlier discussed the national toxicology program. The issue here is not experimentation or testing done within NIH. The issue concerns Government regulatory agencies, as Dr. Rowan just pointed out, requiring industry to do ever more animal testing regardless of need or relevancy. I think what this committee could do is request the national toxicology program and all other regulatory bodies, to immediately organize high-level task forces to develop and validate batteries of nonanimal systems to replace current animal tests.

A recent paper by the Office of Technological Assessment, "Assessment of Technologies for Determining Cancer Risks from the Environment," June 1981, refers to more than 100 short-term tests and I think we need to develop batteries of these tests to actually replace animal testing systems.

And I think this task force could also evaluate which animal tests could be halted right away, because the data is not obviously relevant to protecting the public health and the environment.

I think that were this subcommittee to request such a report from the Office of Technological Assessment in relation to the regulatory agencies, this would be an effective challenge to the bureaucratic inertia of using archaic painful 50 year old tests. There is enormous scientific progress and creativity, but in parallel, we see the expansion and maintenance of archaic testing systems which use up tens of millions of animals.

Here is something where no Federal funds are involved. As a matter of fact you would be doing good for the consumer, for public health, for the taxpayer, for productive science. Everybody would benefit, including obviously, the lab animals.

Mr. **Walgren**. Mr. Weber.

Mr. **Weber**. Thank you, Mr. Chairman.

Along that line, and Dr. Rowan maybe you are the best one to answer this. Information which the subcommittee has on hand from the National Academy of Sciences states that over the last 10 years there has been about a 40-percent reduction in the use of animals in laboratory tests. Do you accept that figure?

Dr. **Rowan**. No, I do not. That figure is based on two surveys done in 1968 and 1978, and in 1968 I think the figure that they quoted was 34 million or 33 million; in 1978 they quoted a 19½ million figure. The accurate figure, as far as I am concerned, and this is in my detailed testimony and substantiated I believe by the facts, is somewhere between 50 and 80 million. I am sorry that it is so loose, but one really cannot get anything more than estimates and guesstimates from the animal breeders and from the various people who are knowledgeable in this area.

Mr. WEBER. Do you have any information on trends, which is what I am more interested in than numbers?

Dr. ROWAN. The best information comes from Europe. If you feel that the European examples can be extrapolated to America, well then the trends indicate in England, for example, that the figures are falling. They have fallen from about 5½ million a year to about 4.6 million a year.

Whether that is due to restricted funding, the English biomedical community is suffering a shortage of funds, or to the application of alternatives, is not yet clear. Nobody has done the study.

Mr. WEBER. The National Academy, of course, says that the downward trend in this country, which we may or may not agree with, is due to the economic nonviability of it. It is just simply too expensive, and many scientists are coming to that conclusion and seeking alternatives for economic reasons.

I guess what I am getting at is do you think there is a reduction going on for that reason?

Dr. ROWAN. I would certainly suspect that that is happening in this country. The animals are becoming more expensive. The research questions that are being addressed are more sophisticated; they require a cleaner animal, let us say. You can no longer use the old random source animal to address many of the research issues that are being looked at now.

When you look at histocompatibility antigens you need a very clean animal and an animal with a defined genetic background. And for that reason it is expensive. And for that reason, perhaps, you can make do with 40 instead of 60 in your research work.

Mr. WEBER. I am wondering if that trend is likely to continue because of the economics of it and due to an increased awareness of the issue because of organizations such as those represented by the panelists today. Is it really possible to achieve a greater reduction through Federal funding mechanisms than we are going to achieve through natural workings of the marketplace?

Dr. ROWAN. Well, there are several examples. The Draize test campaign I think demonstrated that there are ideas out there. One of the ideas that is being followed up uses a technique that could have been started in 1911. That is when the first observation was made, but it was never followed up because there was no direct encouragement or incentive to follow that particular idea. When you provide the money the incentive is there.

Second, there are scientists who develop a technique but do not follow it up. There was Dr. Flaxman who developed a technique for human skin culture that is very elegant and a very good scientific technique. He has since discovered there is more money in clinical dermatology, has returned to clinical practice, and that technique lies fallow. I presume it could be employed. These are just isolated, anecdotal examples, but I feel there is a lot more of that out in the scientific community.

Mr. **Walgren**. Mr. Spira.

Mr. **Spira**. Yes. The current issue of M.D. magazine, for October, says——

Mr. **Walgren**. Which magazine? Excuse me.

Mr. **Spira**. M.D. magazine, the cover issue on animal rights says that in the last 20 years the use of experimental animals has more than quadrupled from 20 million in 1958 to 90 million in 1978. And they quote the Charles River corporate director saying that Charles River produces 20 million animals yearly and has 20 percent of the market. This means that at this point there are 100 million animals being used in lab animal research and testing.

Last week's report from Charles River mentions that they are pleased to be able to report a 34-percent increase in income and a 19-percent increase in earnings per share. So I don't think we can just let the marketplace and nature take its course.

I think that the pattern being established in industry, should also be followed in government.

What happened was that Revlon became the pioneer and actually funded research at Rockefeller University, rapidly followed by Avon and other companies. The pattern is that if you use animals you have to energetically seek to cut back the number of animals used and to develop alternatives.

I think there has to be a really focused, targeted effort by the national toxicology program, by NIH, by all the Government agencies that use animals, to develop and validate alternatives, and to reduce the number of animals used, and to report back to this committee as to their progress.

Ms. **Peretsman**. Could I also comment on this question?

Mr. **Walgren**. Surely.

Ms. **Peretsman**. I also feel that there is, as I said in my statement, that there is a very real public health need for better and faster tests to identify carcinogens and toxic substances in environment, in chemical attitudes, and so on, and we do not have the adequate tests now, and that increased Federal funding in this area would help identify those tests, which would help us all as well as reducing the use of the animal tests which have not been satisfactory in this area.

Mr. **Weber**. I have no further questions, Mr. Chairman.

Mr. **Walgren**. Thank you, Mr. Weber.

On behalf of the subcommittee I want to thank the panel very much, and we appreciate your interest in this area. Before going to the last two panels we have with us Congressman Fred Richmond from New York. Mr. Richmond has been active in this area and has a committed interest in animal welfare, in the Congress at an extremely noteworthy level. We welcome you to the committee and appreciate your being able to come and give us some of your thoughts about this issue.

STATEMENT OF HON. FRED RICHMOND, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. **Richmond**. Thank you, Mr. Chairman.

I certainly appreciate your allowing me to appear out of order, but I just was unable to come yesterday and thank you for being so kind to let me come today.

Mr. **Walgren**. You are more than welcome, and we are happy to have you.

Mr. **Richmond**. I have submitted a formal statement and I only ask that my statmeent be inserted in the record at the appropriate place. Also if I may I would just like to take a minute or two to summarize my testimony.

Mr. **Walgren**. Please do. You may proceed as you think best.

Mr. **Richmond**. I want to commend you for your interest and concern in addressing this highly controversial issue of the use of animals in medical research and testing. As sponsor of the Research Modernization Act I share your deep concern, and I am most gratified that these hearings will finally explore legislation to promote more humane and appropriate use of animals.

The Research Modernization Act is an effort to involve the Federal Government in improving biomedical research and biomedical testing.

Specifically the legislation requires, as we know, that wherever possible the Federal agencies develop and use alternative methods of testing that do not use live animals. In the last Congress I introduced the Research Modernization Act, in that last Congress it was H.R. 4805, along with our colleagues Bob Roe and Cap Hollenbeck, both of whom are members of your committee.

We have reintroduced the bill in this Congress as H.R. 556. This bill would not stop all testing that uses live animals. Obviously, many live animal tests are absolutely essential to the public health and safety but we know that there is a lack of coordination among the various Federal agencies in performing research or in giving out grants and contracts. There is too much reliance on live animal testing. There is too much unnecessary duplication on tests.

This is not just an issue of concern about the pain and suffering of laboratory animals. The use of live animals is actually not economical. Many of the alternative methods now in use are cheaper, faster, more efficient, more effective, more accurate than using live animals.

As we know, the best known or most accepted alternative methods are cell cultures, mathematical models and use of modern computer techniques.

Now we all know computer technology is going so quickly; we are going into our fifth generation of computer technology, computer sciences right now, and I believe if we would investigate the ability of this latest generation of computers we would find that we could actually obviate a lot of the experimentation we do on live animals.

The Research Modernization Act was suggested to me by a group of concerned citizens in New York City. They are called United Action for Animals, and I know they are testifying in these hearings.

Support for the bill also comes from groups and individuals all over the United States; over 80 of our colleagues are cosponsoring the legislation.

My very dear friend, Christine Stevens, is here today, representing another of the key animal welfare organizations, the Society for Animal Protective Legislation. That group has been instrumental in opposing the Draize test, the LD50 test, and other controversial testing procedures.

The amount of grassroots interest in H.R. 556 is most gratifying. When I first introduced the bill in 1979 our office was inundated with mail and petititons from all across the United States. Since we reintroduced the bill this year we continue to receive about 200 letters a week in support of the development and use of alternative methods. This is an issue about which the American public feels very, very strongly, as I know you do, Mr. Chairman.

I would like to just summarize the two goals of the Research Modernization Act.

First, we want to reduce the use of live animals in federally sponsored laboratory research and testing where efficient and effective alternative methods exist, and,

Second, we want to eliminate unnecessary duplication of live animal tests by Federal agencies.

The bill was introduced because the Federal Government and the scientific community are not moving far enough or fast enough toward reducing the number of live animals used in laboratory tests. Alternative methods are available, they are effective, they are efficient, and where human health and safety can benefit from their use we certainly feel they ought to be required.

Thank you, Mr. Chairman.

[The prepared statement of Congressman Richmond follows:]

FRED RICHMOND
14th District, New York

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STATEMENT OF REPRESENTATIVE FRED RICHMOND
OCTOBER 13, 1981
AT HEARINGS OF
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
REGARDING
USE OF ANIMALS IN MEDICAL RESEARCH AND TESTING

Mr. Chairman and distinguished members of the Subcommittee on Science, Research and Technology, I appreciate having this opportunity to appear before you today and I commend you for your interest and concern in addressing the controversial issue of the Use of Animals in Medical Research and Testing.

As you listen to the testimony of witnesses who will appear before you representing the government, the scientific and medical community, and groups and individuals concerned with animal welfare, I urge you to consider -- first and foremost -- protection of the public health and safety.

Then, as you listen, question, analyze and develop legislation on what you have correctly labelled a "difficult and emotion-charged issue," I urge you to consider whether the public health will best be served by greater use of accurate, effective, economical alternative methods of testing, as opposed to the present over-reliance and unnecessary redundancy of live animal testing.

In both the 96th and 97th Congresses, I have joined with my friends, your colleagues of the full Science and Technology Committee, Representatives Bob Roe and Cap Hollenbeck, in introducing the Research Modernization Act. This legislation, H.R. 556, is an effort to involve the Federal Government in improving biomedical research and testing.

H.R. 556 calls for Federal agencies to get directly involved in:

-- Participating in a National Center for Alternative Research;

-- Developing and coordinating alternative methods of research and testing not involving the use of live animals;

-- DESIGNING TRAINING PROGRAMS IN THE USE OF ALTERNATIVE METHODS;

-- ELIMINATING UNNECESSARY DUPLICATION OF RESEARCH AND TESTING OF LIVE ANIMALS; AND

-- DISSEMINATING INFORMATION ON ALTERNATIVE METHODS.

IN ADDITION, WE WANTED TO AVOID ANY NEW BUDGETARY BURDENS ON THE FEDERAL AVENCIES. THUS, THE BILL PROVIDES FOR REDIRECTING BETWEEN 30 AND 50 PERCENT OF FEDERAL RESEARCH FUNDS THAT WOULD OTHERWISE BE SPENT ON TESTS USING LIVE ANIMALS TO THE DEVELOPMENT AND USE OF ALTERNATIVE METHODS.

EVEN WITHOUT THIS PROPOSED SUBSTANTIAL REDIRECTION OF FUNDS FROM LIVE ANIMAL TESTING TO THE DEVELOPMENT AND USE OF ALTERNATIVE METHODS, H.R. 556 WOULD STILL BE A CONTROVERSIAL BILL. THE ISSUE OF LIVE ANIMAL TESTING VERSUS DEVELOPMENT OF ALTERNATIVE METHODS IS, ITSELF, HIGHLY CONTROVERSIAL, WITH CLAIMS AND COUNTERCLAIMS FROM REPRESENTATIVES OF BOTH THE RESEARCH COMMUNITY AND THE ADVOCATES ON BEHALF OF ANIMAL WELFARE.

THAT IS WHY I HAVE SOUGHT PRECISELY THIS KIND OF FAIR, OPEN, PUBLIC DEBATE ON THE SUBJECT OF THE USE OF LIVE ANIMALS IN RESEARCH AND TESTING. I BELIEVE THAT THIS SUBCOMMITTEE IS THE VERY BEST PLACE TO DEBATE AND TO FORMULATE THE POLICIES TO BE FOLLOWED BY THE FEDERAL AGENCIES WHOSE GRANTS AND CONTRACTS FINANCE A SIGNIFICANT PROPORTION OF OUR NATION'S SCIENTIFIC AND MEDICAL RESEARCH.

I AM CONVINCED THAT THE RESEARCH MODERNIZATION ACT IS A REASONABLE, PRACTICAL AND ACHIEVABLE LEGISLATIVE INITIATIVE TO INVOLVE THE FEDERAL GOVERNMENT IN DIRECTLY SUPPORTING THE CONTINUED DEVELOPMENT OF VIABLE ALTERNATIVE METHODS OF RESEARCH AND TESTING. SPECIFICALLY, THE LEGISLATION REQUIRES THAT -- WHEREVER POSSIBLE -- THE VARIOUS FEDERAL AGENCIES DEVELOP AND USE ALTERNATIVE METHODS OF TESTING THAT DO NOT USE LIVE ANIMALS.

THIS BILL WOULD NOT STOP ALL TESTING THAT USES LIVE ANIMALS. OBVIOUSLY, MANY LIVE ANIMAL TESTS ARE ABSOLUTELY ESSENTIAL TO PUBLIC HEALTH AND SAFETY. HOWEVER, H.R. 556 SEEKS TO REDUCE, WHERE APPROPRIATE, CONTINUING RELIANCE ON LIVE ANIMAL TESTING, ESPECIALLY WHERE SUCH TESTS ARE UNNECESSARILY REDUNDANT.

WE KNOW THAT THERE IS A LACK OF COORDINATION AMONG THE VARIOUS FEDERAL AGENCIES IN PERFORMING RESEARCH OR IN GIVING OUT GRANTS AND CONTRACTS. THIS LACK OF COORDINATION IS PARTLY RESPONSIBLE FOR THE UNECONOMICAL AND WASTEFUL OVER-RELIANCE ON THE USE OF LIVE ANIMAL TESTING.

MANY OF THE ALTERNATIVE METHODS NOW IN USE ARE, FASTER, CHEAPER, MORE EFFICIENT, MORE EFFECTIVE AND MORE ACCURATE THAN USING LIVE ANIMALS. THE BEST KNOWN AND MOST ACCEPTED ALTERNATIVE METHODS ARE:

-- CELL CULTURES

-- MATHEMATICAL MODELS

-- USE OF MODERN COMPUTER TECHNIQUES.

THERE ARE OTHER ALTERNATIVES . WE LIST EXAMPLES IN OUR BILL: MECHANICAL MODELS; ORGAN AND TISSUE CULTURES; LOWER ORGANISMS; CHEMICAL ASSAYS; ETC. SEVERAL OF THESE ALTERNATIVE METHODS CAN NOW BE SUBSTITUTED FOR LIVE ANIMAL TESTS IN CERTAIN RESEARCH SITUATIONS.

CERTAINLY, IT IS NOT MY INTENTION TO INTERFERE WITH ESSENTIAL MEDICAL RESEARCH, BE IT CANCER RESEARCH, NUTRITION RESEARCH, OR ANY OTHER MEDICAL OR SCIENTIFIC INQUIRY. LET ME REITERATE THAT IT IS NOT MY INTENTION TO STOP THE USE OF LIVE ANIMALS IN SCIENTIFIC OR MEDICAL RESEARCH OR TO PREVENT RESEARCHERS FROM VALIDATING TEST RESULTS BY DUPLICATING EXPERIMENTS USING LIVE ANIMALS. IN SHORT, IT IS NOT MY INTENT TO IMPACT NEGATIVELY ON THE PUBLIC HEALTH AND SAFETY. WHILE I APPRECIATE THE CONCERNS EXPRESSED BY MEMBERS OF THE RESEARCH AND ACADEMIC COMMUNITIES WHO HAVE CONTACTED ME SINCE THE RESEARCH MODERNIZATION ACT WAS FIRST INTRODUCED, I AM CONVINCED THAT ANY REASONABLE INTERPRETATION OF H.R. 556 WOULD SHOW THAT NEITHER SCIENCE, NOR THE PUBLIC HEALTH IS IN ANY DANGER.

THE RESEARCH MODERNIZATION ACT WAS SUGGESTED TO ME BY UNITED ACTION FOR ANIMALS, INC.,A GROUP OF SOME 15,000 CONCERNED, COMPASSIONATE INDIVIDUALS DEDICATED TO THE HUMANE TREATMENT OF ANIMALS. YOU WILL HEAR FROM REPRESENTATIVES OF THAT GROUP DURING THESE HEARINGS.

SUPPORT FOR THE LEGISLATION COMES FROM GROUPS AND INDIVIDUALS ALL ACROSS THE UNITED STATES. OVER 80 OF OUR COLLEAGUES ARE COSPONSORING H.R. 556. YOUR SUBCOMMITTEE ALSO WILL CONSIDER OTHER LEGISLATION THAT WILL STRENGTHEN OUR NATIONAL COMMITMENT TO ANIMAL WELFARE AND, IF I MAY TAKE JUST A MOMENT TO DIGRESS FROM H.R. 556, IT WILL BE TO COMMEND MY GOOD FRIEND AND COLLEAGUE, THE GENTLEWOMAN FROM COLORADO, REPRESENTATIVE PAT SCHROEDER, FOR INTRODUCING HER BILL TO AMEND THE ANIMAL WELFARE ACT TO ASSURE THE HUMANE TREATMENT OF LABORATORY ANIMALS. I URGE YOUR FAVORABLE CONSIDERATION OF THAT LEGISLATION.

ALSO, MR. CHAIRMAN, IN ATTENDANCE TODAY AT THESE HEARINGS IS MY VERY DEAR FRIEND, CHRISTINE STEVENS, OF THE SOCIETY FOR ANIMAL PROTECTIVE LEGISLATION. THAT GROUP HAS BEEN INSTRUMENTAL IN OPPOSING THE DRAIZE TEST, THE LD-50 TEST AND OTHER CONTROVERSIAL TESTING PROCEDURES. (I UNDERSTAND FROM CHRISTINE AND PAT SCHROEDER, THAT THE SUBCOMMITTEE MEMBERS ARE BEING INVITED TO A RIVETING VIDEO TAPE PRESENTATION TOMORROW AFTERNOON, DETAILING THE ABUSE OF LABORATORY ANIMALS. I URGE YOU TO ATTEND THIS VERY BRIEF, BUT MOST IMPORTANT SHOWING.)

THE SUBJECT OF YOUR HEARINGS IS ONE ABOUT WHICH MANY, MANY PEOPLE FEEL VERY STRONGLY. THE AMOUNT OF GRASSROOTS INTEREST IN THE RESEARCH MODERNIZATION ACT IS MOST GRATIFYING. WHEN WE FIRST INTRODUCED THE BILL IN 1979, MY OFFICE WAS INUNDATED WITH MAIL AND PETITIONS FROM ALL ACROSS THE U.S. SINCE WE REINTRODUCED THE LEGISLATION THIS YEAR, I CONTINUE TO RECEIVE ABOUT 200 LETTERS A WEEK IN SUPPORT OF THE DEVELOPMENT AND USE OF ALTERNATIVE METHODS.

LET ME BRIEFLY SUMMARIZE OUR GOALS IN INTRODUCING THE RESEARCH MODERNIZATION ACT:

(1) WE WANT TO REDUCE THE USE OF LIVE ANIMALS IN FEDERALLY-SPONSORED LABORATORY RESEARCH AND TESTING, WHERE EFFICIENT AND EFFECTIVE ALTERNATIVE METHODS EXIST; AND,

(2) WE WANT TO ELIMINATE UNNECESSARY DUPLICATION OF LIVE ANIMAL TESTS BY FEDERAL AGENCIES.

THE LEGISLATION WAS INTRODUCED BECAUSE, GIVEN THE "STATE-OF-THE-ART", NEITHER THE RESEARCH COMMUNITY NOR THE FEDERAL GOVERNMENT ARE MOVING FAR ENOUGH OR FAST ENOUGH TOWARD ACHIEVING THOSE TWO VERY IMPORTANT GOALS.

H.R. 556 DOES NOT ESTABLISH SOME NEW BUREAUCRACY, NOR DOES IT SEEK TO OVERRIDE OR SUBSTITUTE FOR CURRENT REVIEW PROCEDURES IN THE RESEARCH AND TESTING PROCESS. THE LEGISLATION SIMPLY SEEKS TO IMPROVE COORDINATION AND COMMUNICATION AMONG FEDERAL AGENCIES AND TO ASSURE THAT YOUNG SCIENTISTS WILL BE TRAINED TO THINK OF AND UTILIZE ALTERNATIVE METHODS OF TESTING, INSTEAD OF MERELY REPEATING IN LOCK-STEP THE LIVE ANIMAL METHODS IN WHICH THEY, AND GENERATIONS OF RESEARCHERS, HAVE BEEN INDOCTRINATED.

MR. CHAIRMAN, MY DISTINGUISHED COLLEAGUES: ALTERNATIVE METHODS OF TESTING ARE AVAILABLE; THEY ARE EFFECTIVE; THEY ARE EFFICIENT; AND, WHERE HUMAN HEALTH AND SAFETY CAN BENEFIT FROM THEIR USE, THEY SHOULD BE REQUIRED --- ESPECIALLY WHEN THE TAXPAYERS, THE VAST MAJORITY OF WHOM VIGOROUSLY OPPOSE THE USE OF LIVE ANIMAL TESTS, ARE PAYING THE BILLS.

THANK YOU.

Mr. WALGREN. Thank you very much, Congressman Richmond. I certainly want to say how much I personally appreciate your interest in this area over the number of years that you have pursued it. It is awfully easy for Congressmen to get distracted by the larger financial questions of the country and the political questions that generally go right by the issues of animal welfare. The demands that our constituents put on us are really more to keep their lives financially intact, rather than go beyond that, so your interest in this is certainly to be commended.

The thing that strikes me, and I wonder if you have any thoughts about this, in these hearings there seems to be behind the Government involvement a kind of inertia in requiring a whole battery of tests because we have always done it that way. And even though the public itself is skeptical about the actual validity of tests based on animals in some instances, nonetheless we have this momentum that is going out there. At the same time we have a whole scientific base or certainly noncommercial base of economic activity that is based on carrying out these tests and the proposals keep coming because it literally provides bread for the table of those involved in that industry. It might even be described as an industry.

One of the things that strikes me so positively about the alternative push is that at least it would get us to rethink all of the present practices, and justify them again, keeping those that are justified. But we probably would be very surprised at the conclusions of some of our current practices that we would rethink and perhaps find not justified on the scale that the society is now continuing to carry them out. That is my reaction to the alternative push, and I would be curious whether you see light at the end of that tunnel.

Mr. RICHMOND. Mr. Chairman, I think we found in so many pieces of legislation, so many actions of Government that the status quo was always the accepted method. If the doctors say that this is the way things ought to be we lay people, who theoretically know nothing about medicine, are supposed to say, Well, that's just fine; I guess we will have to do it that way.

But apparently there has been so much study of so many people, so many really well-motivated people who have spent their entire lives, like Christine Stevens, on this subject, and they visit the laboratories, they understand what is going on, and it has finally occurred to them that we are just being totally wasteful, wasteful of laboratory animals, wasteful of money, that we could do much, much more efficient experimentation using this incredible fourth generation of computers with which we are working now.

So we would get better experimentation for lower money, and in addition we would be treating the animals a lot more humanely.

Mr. WALGREN. Well I certainly appreciate your interest in this and am going to look forward to trying to convince some other members with you, that this is the way we ought to——

Mr. RICHMOND. And the fact that we have 80 cosponsors in the case, that many of our colleagues feel the same, I think, Mr. Chairman.

Mr. WALGREN. Tremendous. Thank you very much.

The third panel is made up of university-related witnesses. I am rearranging the order somewhat and asking to join the third panel Dr. Gerald Levey, the chairman of the department of medicine, University of Pittsburgh School of Medicine, who will be representing the Association of American Medical Colleges and the American Federation for Clinical Research.

And along with Dr. Levey we also have Dr. Ernst Knobil who is the Richard Mellon professor of physiology at the University of Pittsburgh School of Medicine and also Dr. John Patrick Jordan, the director of the agricultural experiment station of Colorado State University. Dr. Jordan is representing the American Institute of Biological Sciences; Dr. Sheldon Wolff, the professor and chairman of medicine at Tufts University College of Medicine. Dr. Wolff will be representing the National Society for Medical Research. And, finally, Dr. Edward Melby, the dean of the Cornell University College of Veterinary Medicine, and Dr. Melby is representing the Association for Biomedical Research.

Gentlemen, I want to welcome you to the committee, and perhaps it would make sense to proceed in the order that I introduced you.

Dr. Levey.

STATEMENTS OF DR. GERALD LEVEY, CHAIRMAN, DEPARTMENT OF MEDICINE, UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE; DR. ERNST KNOBIL, THE RICHARD B. MELLON PROFESSOR OF PHYSIOLOGY AND CHAIRMAN OF THE DEPARTMENT, UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE; DR. JOHN PATRICK JORDAN, DIRECTOR, COLORADO STATE UNIVERSITY EXPERIMENT STATION, FORT COLLINS, COLO., AND CHAIRMAN, PUBLIC RESPONSIBILITIES COMMITTEE, AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES; DR. SHELDON M. WOLFF, CHAIRMAN, DEPARTMENT OF MEDICINE, TUFTS UNIVERSITY SCHOOL OF MEDICINE; AND DR. EDWARD C. MELBY, JR., DEAN, CORNELL UNIVERSITY COLLEGE OF VETERINARY MEDICINE

STATEMENT OF DR. GERALD LEVEY

Dr. LEVEY. Good morning. I am Dr. Gerald Levey, chairman of the department of medicine at the University of Pittsburgh School of Medicine.

I am here to speak on behalf of both the Association of American Medical Colleges and the American Federation for Clinical Research. Together these organizations represent the largest group of biomedical investigators in the Nation.

Given the time constraints I will only summarize the AAMC and the AFCR response to a few of the subcommittee's concerns, but I would request their more detailed statement be entered into the hearing record.

Mr. WALGREN. That will be fine.

Dr. LEVEY. To begin I would like to outline the basic premises on which the views of the AAMC and AFCR are founded.

First and foremost, these organizations are of the firm belief that the overriding goal of scientific investigation is the protection and enhancement of human life. Achievement of this goal is heavily dependent upon the development of new drugs and a host of therapeutic modalities which will almost always require testing in living organisms.

Second: A vital component of this endeavor is the necessity of utilizing animals for experimental purposes.

In many cases, alternative methods, which do not involve the use of animals or humans may complement testing on living organisms and may well result in a reduced reliance upon animals at some point in the investigative process.

However, the basic reality is that, for many forms of bioassay, adequate alternatives simply do not exist because of the impossibility of replicating in vitro all of the systems, many not completely understood, of a complex higher organism.

Third: The AAMC and AFCR are unalterably opposed to the mistreatment and unnecessary use of animals in researach on ethical grounds.

Furthermore, humane treatment of these creatures is essential to high quality science. Accurate and valid data cannot be derived from experimentation upon sick, poorly maintained or abused animals; and

Finally, the AAMC and AFCR are fully supportive of reasonable proposals to develop alternative methods. The major incentive to develop improved alternative methods lies in the nature of the scientific investigative process itself. It demands a constant search for improved, more precise methodology.

Major problems are raised by H.R. 556, the Research Modernization Act of 1981, which would require that 30 to 50 percent of NIH's appropriations for research involving animals be earmarked solely for the development of alternative methods, and other legislative proposals.

Enactment of this requirement would seriously impede the mission of the NIH to advance the public health and protect human life by requiring that a large portion of the funds available be diverted at a time when appropriations are already seriously constrained.

I think it fair to ask, is it preferable to divert substantial amounts of funds for biomedical research toward the development of imprecise in vitro methods?

The truth is that major medical advances have been and will most likely continue to be contingent upon the knowledge garnered from animal experimentation because of the complexities of the intact organism.

While all the areas in which animal research has had a major impact in the understanding, prevention, treatment, and cure of human disease are too numerous to mention, I would like to note a few: Hypertension and the role of the kidney in both cause and effect that led to the development of its treatment with diuretics; cardiac valvular surgery for patients with congenital and rheumatic heart disease; coronary artery bypass graph surgery; renal transplant surgery and now all other aspects of transplant surgery, including the development of pancreatic transplants for diabetes mellitus, liver, lung, heart, and intestinal transplants; study of therapy to decrease the size and extent of myocardial infarction; cardial pacemakers; treatment of Hyaline Membrane disease which took the life of one of President Kennedy's children and whose mortality is now less than 10 percent, compared to 90 percent 15 to 20 years ago; and the understanding of emphysema and other respiratory diseases.

These advances, as well as others not mentioned, have resulted in improvement in the quality of life and/or cure of the disease in not thousands, but millions of human beings, not only in America but throughout the world. I venture to say they have affected the lives of members of the families of every member on this committee and every person in this room.

In conclusion, I would urge members of the subcommittee to carefully evaluate the very substantial positive long-range benefits of the use of animals in biomedical research to mankind and to assess the wisdom of the legislative approach to the development of alternative methods.

One must raise the question of whether reducing funding for other biomedical research programs as well as reducing the use of animals in medical investigations would be in the best interest of those who will be most affected, the human patient.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Levey follows:]

aamc association of american medical colleges

Statement of the
Association of American Medical Colleges
on
The Use of Animals in Research

The Association of American Medical Colleges (AAMC) and the American Federation for Clinical Research (AFCR) appreciate this opportunity to share their thoughts on the very important and complex issues surrounding the use of animals in research.

The members of the AAMC are involved not only in the undergraduate and graduate education of physicians in medical schools and teaching hospitals, but also in biomedical and behavioral research. The constituency of the Association includes all of the 126 medical schools in the United States, over 400 teaching hospitals and 70 academic and professional societies whose members are engaged in the delivery of health care, medical education, biomedical and behavioral research. The AFCR is the largest clinical research organization in the United States and is comprised of more than 10,000 physician investigators interested in promoting and encouraging original research in clinical and laboratory medicine. As such, these two organizations represent the largest single component of the Nation's biomedical and behavioral research enterprise. Thus, the subject of this hearing is of deep concern to the membership of both the AAMC and AFCR.

Submitted by the Association of American Medical Colleges to the Subcommittee on Science, Research and Technology of the House Science and Technology Committee. October 14, 1981

Suite 200/One Dupont Circle, N.W./Washington, D.C. 20036/(202) 828-0400

BASIC PREMISES

Prior to outlining the response of the AAMC and the AFCR to the five issues the Subcommittee has identified as its predominant concern, a brief discussion of the premises on which these views are founded would appear useful:

- First and foremost, the Association and the AFCR are of the firm belief that the overriding goal of scientific investigation is the protection and enhancement of human life. In the constantly evolving frontier we know as biomedical and behavioral science, achievement of this goal is heavily dependent upon the development of new drugs and a host of therapeutic modalities which almost always require testing in living organisms, and, eventually, in human subjects. By definition, all such experimentation entails some degree of risk---risks which must be taken if the human condition is to advance and our society is to be rid of the suffering and disease which diminish the quality and duration of life for millions of Americans.

- A vital and necessary component of this endeavor is the utilization of animals for experimental purposes. In many cases, *in vitro* methods complement testing in living organisms and may well result in a reduced reliance upon animals at some point in the investigative process. However, the basic reality is, that for many forms of bioassay, adequate alternatives simply do not exist because of the impossibility of replicating *in vitro* all of the systems---many not yet completely understood---of a complex higher organism.

- The Association and the AFCR are unalterably opposed on ethical grounds to mistreatment or unnecessary use of animals in research. Moreover, humane treatment of these creatures is essential to high quality scientific investigation. Accurate and valid data cannot be derived from experimentation upon sick, poorly maintained or abused animals; and finally

- The AAMC and the AFCR are fully supportive of reasonable proposals to develop methods which reduce or eliminate the use of animals whenever possible.

It is from this perspective that the AAMC and the AFCR address the Subcommittee's specific concerns.

THE INAPPROPRIATE AND UNNECESSARY USE OF ANIMALS IN RESEARCH

The inappropriate and unnecessary use of animals in research is especially difficult to assess accurately because the determination of misuse is generally a matter of subjective judgment, frequently depending upon an individual's scientific knowledge, expertise, and understanding of the potential benefits to be derived from specific experimental procedures.

However, research animals are protected by an array of laws, regulations and guidelines administered by the Department of Agriculture (USDA), the National Institutes of Health and state, county and municipal governments that are designed to obviate inappropriate use and abusive treatment. Furthermore, various organizations in the private sector complement or assist in the implementation of these laws and regulations by their own activities.

Through these mechanisms, virtually every aspect of animal care and usage in the scientific enterprise is addressed. For example, the regulations under the aegis of the USDA alone prescribe minimum standards for handling, housing, feeding, sanitation, ventilation, shelter from the extremes of weather and temperature, veterinary care and avoidance of unnecessary pain; moreover, the USDA is now in the process of reviewing these regulations to determine the need for appropriate revisions. In addition, approval of applications to the NIH for research grants or contracts involving the use of animals is contingent upon: the submission of an assurance acceptable to the Office for Protection from Research Risks (OPRR) certifying the existence of both an institutional committee to oversee animal facilities and procedures and appropriate mechanisms to insure compliance with the NIH Guidelines; and a detailed rationale for utilizing animals in the proposed activity. The proposal must include confirmation that: the species and numbers of animals are appropriate; unnecessary discomfort and injury will be avoided; and analgesic, anesthesia and tranquilizing drugs will be used where indicated to minimize stress. Furthermore, the scientific merit of all applications for research grants and contracts is subject to the rigorous scrutiny of the peer review process.

These govermental processes are extended by the educational programs and related activities of the American College of Laboratory Animal Medicine and the American Association for Laboratory Animal Science. The former certifies veterinarians who have met the criteria established by the College for training and experience in laboratory animal medicine. The latter publishes the Journal of Laboratory Animal Science and assists in the training of technicians in laboratory animal activities. The well-established, highly regarded standards for animal care promulgated by American Association for Accreditation of Laboratory Animal Care (AALAC) are used by both public agencies and private sector institutions and organizations for the purpose of assessing the quality of facilities for laboratory animals. Thus, in the best traditions of our society, government and non-government agencies cooperate to assure the realization of an important societal objective, the assurance of well cared-for animals as a resource for important, well-designed and humanely conducted experiments.

Evidence suggests that the majority of research animals are humanely treated and appropriately used in experimental procedures. However, it cannot be denied that instances of abuse exist. The unfortunate truth is that in every field of human endeavor, there can be found individuals of aberrant character engaging in questionable and socially unacceptable behavior. Fortunately, instances of such behavior are infrequently encountered.

WAYS TO PROMOTE MORE HUMANE AND APPROPR[illegible]TE USE OF ANIMALS

Overall, the Association would suggest that the realistic means to promote more humane treatment of animals lies in greater self-regulation, which is in large measure, dependent upon a growing sensitivity and awareness of the problem on the part of each and every scientist. Science is a constantly evolving endeavor, continually subject to reevaluation and modification by both internal and external forces. The environment in which biomedical research is conducted today reflects the remarkable increase of awareness within our society generally about ethical issues affecting both humans and animals. The use of animals in research has not been an exception to this evolution as evidenced by the major strides that have been made in this arena; there is every reason to believe that such progress will continue in the years ahead.

More specifically, strong inducements---aside from the obvious ethical ones---already exist to foster this goal:

- Most important is the reality that the humane treatment of research animals is intrinsic to scientific excellence from both ethical and scientific perspectives.
- Strong economic sanctions are already in place to help foster the appropriate use of animals. Those institutions found to permit violations of the procedures set forth in the "Public Health Service's Policy on Human Care and Use of Animals" could be faced with suspension or termination of current research support and the loss of future awards involving the use of animals.
- Improved technology such as the MEDLAR and other information transfer systems has made substantial inroads in permitting scientists to better plan their protocols and to avoid duplicative procedures involving animals. There is every reason to believe that this trend will continue commensurate with the pace of technological advances.

INCENTIVES FOR DEVELOPMENT OF MORE AND IMPROVED ALTERNATIVES TO ANIMAL USE

The major incentive to develop improved *in vitro* methods lies in the nature of the scientific investigative process itself. Whatever the specific research goal, there occurs predictably a constant search for improved and more precise methodology. Methodological refinement and innovation are implicit elements in all research projects and should not be isolated as a discrete scientific activity. The methods complementing those using living animals that now exist have usually been the consequence of the pursuit of a different objective---such as the development of a new therapeutic agent.

In addition, theere are powerful economic incentives to substitute *in vitro* methods wherever possible. Research involving animals is extremely costly: it entails their purchasing, care and feeding, the expense of maintaining the necessary staff to fulfill these functions, as well as the additional responsibility of insuring propoer adherence to a host of animal care regulations, guidelines, and reporting requirements. In these times of ever less adequate support, reducing costs of scientific research by using *in vitro* methods is a major concern of investigators.

Contrary to what appears to be popular belief, significant progress has been made in the search for techniques that do not involve the use of animals. A study conducted by the Institute for Laboratory Animal Resources of the National Academy of Sciences National Research Council demonstrates an almost 40% reduction in the number of animals used in research in the period from 1968-1978. Moreover, the NIH already devotes significant sums to research involving *in vitro* methods. Estimates indicate that extramural research projects utilizing neither humans nor other mammals, comprised approximately 30% of the NIH's research grant applications for Fiscal Years 1978-1980.

RESPONSE TO PROBLEMS RAISED BY LEGISLATIVE PROPOSALS

A variety of bills designed to provide greater incentives to develop alternative methods have been referred to this Subcommittee. Overall, the AAMC and AFCR seriously question the approaches suggested by these proposals. While the Association has already made its views known to the Subcommittee on the most troublesome of these, H.R. 556, "The Research Modernization Act of 1981", several points merit additional attention. This legislation would require that 30 to 50% of the NIH's appropriations for research involving animals be earmarked solely for the development of *in vitro* methods. Unfortunately, there is no guarantee and indeed a vanishingly small probability that a sufficient number of sound research proposals with that objective would be forthcoming to utilize the set-aside funds effectively.

Enactment of this requirement would certainly seriously impede the mission of the NIH to advance the public health and protect human life by requiring that a significant portion of its appropriations be diverted, at a time when funding is already seriously constrained. Few people here today have not lost a friend or relative to the ravages of cancer or some other insidious disease. Would it have been preferable to divert substantial sums to attempt the development solely of *in vitro* methods rather than other forms of research, which in themselves, could not only possibly ameliorate or cure diseases afflicting literally millions of Americans, but also improve methodology as well?

For many of the same reasons, the AAMC and the AFCR also question the wisdom of H.R. 220, "The Humane Methods of Research Act," which would authorize the expenditure of $12 million for the development of alternative methods. In this period of budgetary austerity, it is wholly unreasonable to expect $12 million in new funds for this purpose; although the trail may be obscured, the "alternative methods" money will surely be offset by a reduction in NIH program funds. Another bill, H.R. 4406, "Amendments to the Animal Welfare Act," raises further concerns. This legislation would embody in statute practices which are already commonly in force in most research institutions; moreover, it would do so in extreme detail. In addition, it defines the term "pain" as "not only hurtful, immediate physical sensations resulting in more than momentary distress, but also dehabilitation and significant physical and behavioral suffering." If this definition is meant to be used as an inspection criterion, its application would obviously be very subjective. Further, it should be pointed out that research facilities registered with the USDA are required to submit annual reports which identify: the species and number of laboratory animals used; those exposed to procedures involving pain or distress; and whether appropriate anesthetic, analgesic or tranquilizing drugs were administered.

Finally, the bill would eliminate the provision in present law precluding the Secretary of Agriculture from interfering with the actual design and conduct of research. From the perspective of the scientific research community such a departure from current practice would be totally unacceptable. If past experience is any criterion, the individuals charged with responsibility for the additional oversight, although well-intentioned, would not have the technical background to discharge effectively the new responsibility. The peer review system ---which constitutes the cornerstone of American science---offers in combination with other safeguards a much more appropriate and effective method of overseeting the process of scientific investigation.

AREAS IN WHICH ANIMAL-BASED RESEARCH REMAINS CRITICAL

Major medical advances have been and will most likely continue to be contingent upon the knowledge and data garnered from animal experimentation. As noted previously, alternative methods, in most important instances, can only complement animal research.

It is noteworthy that 43 of the Nobel Laureates in Physiology and Medicine, since the program's inception in 1901, accomplished their prize-winning research through the use of animals including the two awards announced only last week. Despite the progress made to date in *in vitro* methods, there are many, many areas in which animal research remains crucial to the protection or improvement of human life because the potential of alternatives to testing in the complex of physiological and psychological systems found in the intact animal are quite limited. While these areas are too numerous to record here, an enumeration of a few would prove illustrative:

- Atherosclerosis, the leading cause of death in the U.S.; cell cultures and biochemical and immunlogic analyses may yield valuable data at the cellular and molecular levels on causation and potential therapy but definitive validity must still be established in intact animals.

- Cardiac valvular surgergy for patients with congenital and rheumatic heart disease; bypass graft surgery in patients with coronary artery disease
- Cardiac pace makers for patients with disabling arrythmias
- Therapy to decrease the size and severity of myocardial infarction
- Neurologic diseases and impairments including strokes, multiple sclerosis, amyotrophic lateral sclerosis, epilepsy, myasthenia gravis, brain and spinal cord tumors
- Hypertension and the recognition of the role of the kidney in both cause and effect that led to the development of its treatment with diuretics
- Transplant surgery initially of kidneys and now of other organs, including: pancreatic transplants for diabetes mellitus, liver, lung, heart and intestinal transplants
- Mental illness
- Prosthetic devices to compensate for a host of physical limitations.
- Diabetes, a disease which afflicts 4% of the population of the United States.
- Eye disease and ailments, including cataracts and glaucoma
- Hyaline Membrane disease---the problem that accounted for the death of President Kennedy's infant son---whose mortality is now less than 10% compared to 90% fifteen to twenty years ago.
- Meningitis

- Aplastic anemia, lupus, leukemia and other forms of cancer
- Development of new vaccines and antibiotics to fight the many infectious diseases still in existence, such as infectious hepatitis B and leprosy
- Advancement in the understanding of emphysema and other respiratory diseases.

CONCLUSION

In conclusion, the Association and the AFCR would urge members of the Subcommittee to carefully evaluate the very positive long-range benefits of the use of animals in research to mankind and to assess the wisdom of the legislative approach to the development of alternative methods. Ultimately, the responsibility for the conduct of scientific research and for the protection and appropriate use and treatment of all research subjects, both human and animal, rests with the parent institution and the individual investigator and his peers. Furthermore, the private sector through organizations such as the American Association for Laboratory Animal Science have assumed a cooperative and necessary role in aiding institutions to adequately meet these responsibilities.

One must raise the question whether the set aside---inescapably a reduction in funding for other biomedical and behavioral research programs---as well as efforts to reduce the use of animals in medical investigations would be in the interest of those who will be most affected---the human patient.

The AAMC and the AFCR would be happy to continue to work with the Subcommittee in its efforts to address this highly complex subject.

Mr. Walgren. Thank you, Dr. Levey. Dr. Knobil.

STATEMENT OF DR. ERNST KNOBIL

Dr. Knobil. Mr. Chairman and members of the subcommittee, I am Ernst Knobil, the chairman of the department of physiology of the University of Pittsburgh School of Medicine and the past president of the American Physiological Society and of the Endocrine Society.

On this panel I represent the University of Pittsburgh, the American Physiological Society and the Endocrine Society, but I appear before you also as a concerned citizen, a husband, and a father and one who has had animals in his household since boyhood. As such I am profoundly concerned about the health and safety of my family, as well as about the welfare of animals.

I am most grateful, therefore, Mr. Chairman, for this opportunity to comment on legislation which, if enacted, will, I believe, have dire consequences on the health and safety of our people without significant impact on animal welfare.

This is not because the so-called Research Modernization Act, H.R. 556, proposes alternatives to the use of live animals in research and testing, but because it is the intent of this bill to divert as much as 50 percent of appropriations for biomedical research using animals, to other purposes. And this comes at a time when support for biomedical research is already diminishing at an alarming rate and our highly successful enterprise in this realm is being seriously compromised.

I remind the subcommittee that the alternatives to whole animal research, such as the use of isolated cells in culture or computer simulations which are mentioned in the Research Modernization Act have been developed and validated by biomedical scientists because they are simpler to use as has already been said, are less liable to variability, and are far less expensive. For these reasons scientists employ them enthusiastically whenever possible and appropriate, but unfortunately they do not serve many of our needs at the present time.

In the testing of polio vaccine, for example, where a small error could paralyze hundreds of children, I would not want to have my child or grandchild inoculated with a product that had not been submitted to the most rigorous testing procedures which include the administration of the vaccine to rhesus monkeys and the careful examination of their brains and spinal cords afterward. The issue here, as in many others like it, is not whether to use animals or nonliving alternatives in toxicity testing of this kind, but whether to test powerful drugs and vaccines in animals or in human beings.

We all remember the tragic consequences of thalidomide administration to pregnant women in Europe some years ago. This drug produces the same deformities in animals as it does in human infants. Because we paid attention to this fact in the United States our children were spared these unforeseen catastrophic effects of a supposedly harmless drug. How could a drug prevent the development of arms and legs of a computer, or an isolated cell system?

In seeking remedies for high blood pressure, as Dr. Levey has already mentioned, and other cardiovascular diseases, including stroke, for example, one must first understand the normal functioning of the circulation of the blood and how it is controlled. Then various drugs must be administered and other procedures utilized to alter the system. Animals must be used to conduct this type of vital medical research. Clearly, the alternative here is not a mathematical model or a cell culture system, although these might help, but the use of human beings as experimental animals.

The need to develop, refine, and perfect new surgical procedures in experimental animals before applying them to humans is almost too obvious to mention. Again, the only other alternative is to use humans for this purpose.

Much has been said about the unnecessary duplications of animal studies and the performing of unnecessary or poorly designed experiments. As you know, in research supported by the National Institutes of Health and by the National Science Foundation, all proposals are subjected to rigorous peer review mechanisms, and less than 20 percent of approved projects are funded because of severe budgetary constraints. These review mechanisms albeit not perfect do eliminate in large measure unnecessary research or poorly thought-through experimental designs. Research proposals involving animals which are excessive, unnecessary, uneconomic, or inappropriate have essentially no chance of being funded, although some do slip through. The system is not perfect. In fact, the ever increasing cost of animal research has caused a reduction in the use of animals by some 40 percent in the last 10 years as estimated by the National Research Council—the same information that Mr. Weber mentioned.

But it must be remembered that some experimental duplication and replication is actually required by the scientific process. Fundamental new observations must be repeated and confirmed in other laboratories to rule out the possibility that some unsuspected factor may have influenced the results of a particular experiment.

As already stated the scientific community is hard at work in developing alternatives to the use of whole animals. But it can use some help in moving forward at a more rapid rate. For this reason we support legislation such as H.R. 220 and H.R. 930 which have been introduced to provide additional support for the development and validation of these new research methodologies. They do not now exist in other than very limited areas of medical research and testing and then only as adjuncts, which eventually require confirmation in animals.

Last, we abhor as much as anyone the abuse and neglect of animals as well as the infliction of pain and suffering. Each granting agency and each major scientific society and most scientific journals have explicit guidelines for the care and use of experimental animals. The Animal Welfare Act has stringent provisions for the overseeing of animal facilities, and in my view no new legislation will provide significant new protection against abuse. Although the current activity, as pointed out by Mrs. Stevens, is indeed woefully underfunded. Scientists are only human, and far from perfect. Some, like the occasional physician or nurse or clergyman, become callous and negligent and insensitive, but peer and societal pressures, as well as the actions of animal care committees usually rectify the problem.

Unfortunately, Mr. Chairman, the Congress cannot legislate human kindness and compassion, but it should continue its vigilance in the treatment of animals. As in all other human activities, however, the most restrictive laws will not insure the perfection of human behavior. They may, however, severely obstruct the very efforts designed to benefit mankind by the eradication of disease and the relief of suffering.

The Congress must also be vigilant that this does not come to pass.

Thank you, Mr. Chairman.

Mr. WALGREN. Thank you very much, Dr. Knobil.

Mr. WALGREN. Following Dr. Knobil, Dr. Jordan.

STATEMENT OF DR. JOHN PATRICK JORDAN

Dr. JORDAN. Mr. Chairman and members of the subcommittee, I am Dr. John Patrick Jordan, the director of the Colorado State University Experiment Station which is headquartered at Fort Collins, Colo. Professionally, I am a research biochemist and have served as an animal care director. Today I come before you as chairman of the public responsibilities committee of the American Institute of Biological Sciences, an organization representing 40 biological societies with an amassed membership of more than 80,000.

As you can well understand the biological scientists of the United States are very interested in the issue of animal welfare. I truly believe that the foundation of that interest is the absolute requirement that scientists must deal with experimental and demonstration animals in a humane manner, based upon sound ethics. You may be interested to learn that at Colorado State University the curriculum for veterinary medical students includes a required course in animal ethics and instructors from that course are asked to make presentations at well over half of the veterinary schools in the United States.

The governing board of the American Institute of Biological Sciences has approved under the date of August 3, 1980, a position statement regarding the use of animals in experimentation, and with your indulgence, Mr. Chairman, I would like to read that position statement to you.

> Live animals have long been an important tool in the conduct of scientific research and education. In biomedical, agricultural, toxicological, behavioral, and other biological studies, intact animals perform a vital and irreplaceable function, often serving as models for man. No alternative procedures are known that permit the conduct of some critical kinds of research without live animals. The American Institute of Biological Sciences recognizes that live animals will continue to be an important research source. The AIBS also recognizes that live animals make a meaningful contribution to the education process. Study of animals in the laboratory enhances student sensitivity to, and understanding of, all living creatures.

The position statement goes on, Mr. Chairman:

> The use of animals mandates responsibility to provide quality care and humane treatment. The AIBS endorses the "Principles of Animal Use" promulgated by the National Institutes of Health and National Association of Biology Teachers' "Guidelines for the Use of Live Animals at the Preuniversity Level." Organisms of the lowest phylum consistent with the knowledge to be gained should be used in research and study. Intrusive studies should be discouraged, especially below the intermediate college level. Educators should rely on demonstration and observation; other procedures deemed necessary should be used under the direct supervision of a

qualified instructor. In all circumstances, scientists and educators must fulfill their moral responsibilities to give proper care and humane treatment to the animals they use.

That is the end of the formal position statement, Mr. Chairman, but you may wish to know how that statement has been translated into action at one institution of higher learning.

At CSU the animal care committee which reports to me has as its executive secretary the director of animal care for the university. That committee, and this is probably significant, has been empowered by the governing board of Colorado State University and the State board of agriculture to review proposals involving animals in experimentation. The laboratory animal resource service supervises and maintains facilities, not only for laboratory animals of the classic type, mice, rats, rabbits, guinea pigs, et cetera, but the director also has a universitywide responsibility in the area of equine, bovine, porcine, and ovine species.

The National Institutes of Health guidelines are used as the basis for decision by the animal care committee and the ethical issue of animal research is its cornerstone. A second principle employed, though, is quality research data, which inevitably requires the highest quality of animal care. None of us believes that a nutritional study can be interpreted if the animals are mired in the muck of filth or the results are complicated by an extraneous disease. These two principles, therefore, have been used effectively in moving quality animal care facilities to a markedly higher position on the priority list of the university. Earlier this year we had the privilege of dedicating a new $1.7 million laboratory animal facility.

As an aside, Mr. Chairman, that was totally funded by private contributions.

The question before the committee is whether legislation is needed to assure that the desired results of reducing pain and meaningless use of animals in experimentation is both needed and has the potential for effectiveness. The public responsibilities committee of AIBS feels strongly that such legislation should place the burden of responsibility with the institution and not on a new army of Federal inspectors.

We further recommend that the monitorship of such a program take into account the differences between legitimate research organizations and process of production-oriented laboratories. We think that Federal inspection should focus on the maintenance of quality records within institutions, records that will demonstrate an effective animal care program with appropriate day-to-day supervision. The inspection certainly should have a second point associated with it; namely, to insure that the general state of the facilities is commensurate with the animal care standards outlined in the NIH Guide for the Care and Use of Laboratory Animals That is an excellent document. This practice of self-policing is already in force in the area of human experimentation and we would like to suggest this as is a model for animal care as well.

Recognizing that at this particular time, major public effort is for reducing Federal rules, regulations, and monitorship, prompts the AIBS to continue in its effort to encourage institutional commitment by research organizations to embrace both the philosophy and the specifics outlined in the NIH guide.

Thus, you should know, Mr. Chairman, that even without legislation other groups will be pressing for a continued improvement and upgrading of facilities and techniques used in the handling of animals for research and demonstration. Further, we at the AIBS are interested in encouraging research relative to alternatives that may be effective and appropriate but lessen the need for invasive or hurtful protocols on live animals.

Thank you very much, sir, for allowing us to present our concerns about quality care.

Mr. **Walgren**. Thank you very much, Dr. Jordan.

Dr. Sheldon Wolff.

STATEMENT OF DR. SHELDON M. WOLFF

Dr. **Wolff**. Mr. Chairman and members of the subcommittee, inasmuch as the subcommittee has already received the full statement of the National Society for Medical Research in the interest of our time constraints I will only summarize my remarks prepared for today.

My name is Sheldon M. Wolff and I am professor and chairman of the Department of Medicine at the Tufts University School of Medicine, and physician in chief of the New England Medical Center Hospital.

In addition, I am the president of the Infectious Disease Society of America.

For the last 20 years I have been involved directly with laboratory and clinical research in infectious diseases and immunology. My work involves the use of animals and human beings.

Today I am not only speaking from my first-hand knowledge as a practicing clinician and scientist-researcher, but I am also expressing the collective views of my colleagues who are represented by the National Society for Medical Research.

The National Society for Medical Research applauds the subcommittee for bringing the issues of animal welfare and biomedical research into a forum of open and free discussion.

A basic question before this panel today is how justified are scientists in their use of a relatively small number of animal models—when compared with the total population of a particular animal species—to secure information about bodily functions that may prove to be invaluable in protecting other similar animals, other species, and human beings from suffering, disease, and perhaps an early death.

What often is forgotten in debating that question is that research involving the use of animals is research that may also affect the survival and improved health of domestic pets and farm animals. Many of those who speak most loudly against the use of animals in research have no qualms whatsoever about taking a sick pet to a veterinarian for injection of some life-saving medicine that had to use animals to be developed.

Even where experiments on animals are specifically designed to be advantageous to humans there may be some degree of spinoff which leads to improvement in the care and treatment of accidents and diseases in the member species being used for the investigations. This is true particularly for cats and dogs on which remedial operations can now be performed with every hope of success, due to the development of small animal anesthesia. Such methods came from the search for better human anesthetics.

A large number of the people born since 1950 are alive today because of modern research, most of which was done with the use of animal models. A greater number of farm animals and pets are also alive today because of the same type of research.

It is a fair question to ask that if animal experiments are so important to human welfare why don't we conduct experiments on ourselves? The ultimate observation of healthy and diseased states must be done on human beings: the measurements of hormonal levels, of immunological components of resistance to disease and of disease itself, the ascertaining of the distribution of infectious organisms or of levels of drugs within organs and tissues.

Many other clinically important parameters require observations and tests on human subjects. Similarly, the widespread use of new diagnostic and surgical techniques first involved studies on a small number of human beings. However, it should be emphasized that without preliminary animal experiments it would have been impossible to achieve such a high rate of success when the work was ultimately transferred to human beings.

The subcommittee's question as to whether the use of animals in current research is excessive, unnecessary, uneconomic or inappropriate can only be answered subjectively at best. What may be viewed by some as an abuse of the privilege of using animals can be defended equally as the necessary minimum to achieve success.

Perhaps a group whose opinion should be heard on this question are the patients who have benefited from this research. Unless you have actively worked with those patients who are eagerly awaiting a research breakthrough, the importance of legislative considerations dealing with research are difficult to comprehend.

Most of us here are in good health, but none of us can be assured of continued good health.

The subcommittee has asked about ways to promote more humane and appropriate uses of animals, including alternatives to animals. By and large the term "alternatives" is a misnomer as we really are speaking of the development of adjunct methodologies, and in that context this is a question that no longer is at issue between the two opposing sides.

First of all scientists are desirous of doing their research in the most expeditious and economical manner. Some progress has been made in the development of methodologies which are quicker and less expensive than the use of laboratory animals, and wherever possible such methodologies are in fact in use.

Emphatically, the incentives for the research community to utilize other methodologies already are there. Not the least of these incentives is the continually rising costs just for the purchase, care, and feeding of research animals.

As for the treatment of research animals there undoubtedly are isolated cases of abuse, but I must emphasize these clearly are the exceptions, not the rule. The fact is that all scientists know that valid results cannot be obtained from any animal that is under stress from improper care or treatment.

The National Society for Medical Research staunchly advocates the humane and gentle treatment of animals from an ethical standpoint, as well as from a practical one.

As a further assurance against the misuse of animals in experimental situations the nature and actual details of the experimental procedures proposed by scientists must be acceptable to their peers who are familiar with the field. Their peers also must be able to judge whether the work is repetitious and therefore unjustified, or that the work can be carried out equally effectively by valid and acceptable substitute methods.

Scientists should be allowed to continue their work for the benefit of all, and without hindrance over and above the difficulty of the subject itself if the value of their scientific efforts are to be made available for the public good. Those with no sure knowledge to guide them should not be placed in a position of determining research protocols.

The bills proposed before the subcommittee are legislative actions that would place the review of scientific protocols in the hands of individuals not working in areas involving the majority of the Nation's biomedical and behavioral research, H.R. 4406; would increase the Federal budget to develop alternative methods, H.R. 220 and H.R. 2110; and would distort the biomedical research enterprise by diverting at least 30 percent of the already constrained funds for Federal research to the development of alternative methods which, if initiated, could not absorb such funding effectively, H.R. 556.

The ramifications of these proposals must be weighed carefully against the need to protect human life.

The ultimate justification for the use of animals in biomedical behavioral research and for the appropriation of Federal funds for that purpose is the future of sick people. True, some animal research is not pleasant to watch, but then neither are a severely injured child, open-heart surgery or terminal patients in a hospital cancer ward.

I thank the subcommittee for this opportunity to present the views of the National Society for Medical Research.

Mr. WALGREN. Thank you very much, Dr. Wolff.

[The prepared statement of Dr. Sheldon M. Wolff follows:]

STATEMENT OF SHELDON M. WOLFF, M.D., ON BEHALF OF THE NATIONAL SOCIETY FOR MEDICAL RESEARCH

NSMR - Complete Testimony

October 14, 1981

Mr. Chairman and Members of the Subcommittee:

My name is Sheldon M. Wolff and I am professor and chairman of medicine at the Tufts University College of Medicine. For the last 20 years I have been involved directly with laboratory and clinical research in infectious diseases and immunology which has been recognized both nationally and internationally. My work does involve the use of animals.

Today I am not only speaking from my first hand knowledge as a practicing clinician and scientist-researcher, but also I am expressing the collective views of my colleagues who are represented by the National Society for Medical Research.

Since 1946 the National Society for Medical Research, has served as the umbrella organization for the research interests within the academic centers of medicine, dentistry, pharmacy, optometry, and veterinary medicine; the educational and scientific societies and the voluntary health agencies; the components of the pharmaceutical, chemical, and instrumentation industries; and, individual scientists, teachers, and members of the public-at-large. This constituency represents more than 300 institutions involved in research and approximately 4,000 individuals.

It is the consensus of this constituency which I am representing today.

The National Society for Medical Research applauds the Subcommittee for bringing the issues of animal welfare and biomedical and behavioral research into a forum of open and free discussion. For too many years now these issues have been voiced only in terms of innuendoes, half-truths, and deliberate misstatements. By and large, both extremes dealing with this single-issue question are guilty of such tactics. Today, however, is the time for all witnesses to be open and candid in their comments and responses to the concerns and questions about the use of animals in research and teaching. This is our intent and we hope that all others will do the same in the exploration of the issues at hand.

At the outset, permit me to identify five areas of biomedical and behavioral research that involve experiments using animals.

The first is the observational experiment. This includes investigations such as the banding of birds to determine ranges and migrations and the behavioral investigations into territorial and social attitudes.

Secondly, there are the feeding experiments which are done to understand the bases of human and animal nutrition and to ascertain the most healthful and economical ways of feeding different species.

The third area involves the assessment of possible damaging effects of plant and metal poisons, pesticides, herbicides, antibiotics, preservatives, processing aids, and the like, that may appear in water and food prepared for both human and animal consumption. It also involves toxicity-testing to determine the levels at which a host of environmental chemicals or drugs specifically designed for animals and humans may be administered without harm or with side effects that are understood and can be justified under the circumstances of a particular disease condition.

A fourth area is the determination of the potential benefits of newly developed therapeutic agents and drugs as well as diagnostic and surgical techniques for the prevention, treatment, and control of diseases affecting both humans and animals.

Lastly, there are animal experiments which are essential for a fundamental understanding of the functioning of individual cells, tissues, and organs in healthy and diseased animal and human bodies.

All five of the areas described share a common denominator in that benefits accrue to animals as well as to human beings.

Human progress cannot continue without the preservation of animal life. And without human help in today's complex world many species, especially the domesticated animals, could not survive. Knowledge of the ways in which human beings and animals function is essential for both the prevention of inadvertent destruction of the environment as well as for the control of the spread of communicable diseases, parasites, and pests of both humans and animals.

A basic question before this panel today is how justified are scientists in their use of a relatively small number of animal models--when compared with the total population of a particular animal species--to secure information about bodily functions that may prove to be invaluable in protecting other similar animals, other species, and human beings from suffering, disease, and probably an early death?

What often is forgotten in debating that question is that the research involving the use of animals also is research that may affect the survival and improved health of domestic pets and farm animals. Many of those who speak most loudly against the use of animals in research have no qualms about taking a sick pet to a veterinarian for an injection of some life-saving medicine that had to use animals to be developed.

Even where experiments on animals are specifically designed to be advantageous to human beings, there frequently is some degree of spin-off which leads to the improvement in the care and treatment of accidents and diseases in the member species being used for the investigation. This is true particularly for cats and dogs on which remedial operations now can be performed with every hope of success due to the development of small animal anesthesia which came from the search for better human anesthetics.

More than one-third of the people born since 1950 are alive today only because of modern research, most of which was done with the use of animal models. A greater number of farm animals and pets are alive today because of that same research.

It is a fair question to ask that if animal experiments are so important to human welfare why don't we conduct experiments on ourselves?

The answer, which may surprise some, is that we do. Once the basic idea of a particular line of treatment is established in animals a rapid transfer occurs so that human benefits can be determined early.

The ultimate observation of healthy and diseased states must be done on human beings. The measurements of hormonal levels; of immunological components of resistance to disease and of disease itself; the ascertaining of the distribution of infectious organisms or of levels of drugs within organs and tissues; and, the many other clinically important parameters require observations and tests on human subjects. Similarly, the widespread use of new diagnostic and surgical techniques first involved a small number of humans.

This research, of necessity, requires careful attention to the ethics of research on human subjects and it is reviewed in each research institution by a special committee which includes public members. The public is entitled to assurance that such a review is conducted and it expects it. Research on animals, prior to work on human subjects, is precautionary; it cannot be dispensed with.

For example: After a small number of animals had been used to work out the methods for dealing with circulatory disorders, such as heart disease, atherosclerosis, and "blue babies," operations then were performed for many years on humans that only could be described as "experimental" because the outcome of such operations could not be predicted with any degree of certainty.

But without preliminary animal experiments it would have been impossible to achieve such a high rate of success when the work was first transferred to human subjects.

Any claim that perfecting the treatment of circulatory diseases, the development of vaccines and antibiotics, or the development of life-saving surgical techniques was an excessive, unnecessary, uneconomical or inappropriate use of animals should be challenged. Not so much by the scientific community, but challenged by the father-or-mother or the son-or-daughter of a patient who is alive and well today because of this work.

The Subcommittee's question as to whether the use of animals in the current practices of research is excessive, unnecessary, uneconomic, or inappropriate can only be answered subjectively at best. What may be viewed by some as an abuse of the privilege of using animals can be defended equally as the necessary minimum to achieve success.

Perhaps a group whose opinion should be heard on this question are the patients who have benefited from this research.

Whenever legislation involves a product that can be drunk, eaten, inhaled, or absorbed into the body, it implies research involving animals. And if legislation restricts or inhibits such research the only group directly affected are the patients who otherwise can expect prolonged disease and pain and probably an early death.

Unless you have actively worked with those patients who are eagerly awaiting a research breakthrough, the importance of legislative considerations dealing with research are difficult to comprehend. Most of us here are in good health--perhaps a few diabetics, asthmatics, some with migraine or blood pressure problems. But none of us can be assured of continued good health.

The Subcommittee has asked about ways to promote more humane and appropriate uses of animals, including alternatives to animals. By and large, the term alternatives is a misnomer as we actually are speaking of the development of adjunct methodologies. And in that context, this is a question that no longer is an issue between the two opposing sides.

First of all, scientists are desirous of doing their research in the most expeditious and economical manner. Some progress has been made in the development of methodologies quicker and less expensive than the use of laboratory animals. And wherever possible such methodologies are in use.

Emphatically, the incentives for the research community to utilize other methodologies already are there. Not the least of these incentives is the continually rising cost just for the purchase, care, and feeding of the research animals.

From the best estimates of the data gathered by the National Society for Medical Research, the total cost for all animals used in this country for biomedical and behavioral research represents less than seven (7) percent of the total outlay of dollars for all of the research currently being done in the private and public sectors. Although the percentage itself is small, it does represent a sizeable cost when matched against the several billions of dollars being expended annually in research.

Additionally, the number of animals used in experiments has declined. Again from the data gathered by the National Society for Medical Research and other organizations it is apparent that the number of animals currently being used in all research facilities has been reduced by at least 40 percent since 1968.

As for the treatment of research animals, there undoubtedly are isolated cases of abuse. But I must emphasize these clearly are the exceptions, not the rule. The fact is that all scientists know that valid results cannot be obtained from any animal that is under stress from improper care or treatment. The National Society for Medical Research advocates staunchly the humane and gentle treatment of animals from an ethical standpoint as well as from this practical one.

By and large, the legislative proposals introduced in the House during this session of the Congress fail to address the major issues as they relate to biomedical and behavioral research.

As a further assurance against the misuse of animals in experimental situations, the nature and actual details of the experimental procedures proposed by scientists must be acceptable to their peers who are familiar with the field. Their peers also must be able to judge whether the work is repetitious and therefore unjustified or whether the work can be carried out equally effectively by valid and acceptable substitute methods.

Scientists should be allowed to continue their work for the benefit of all and without hindrance over and above the difficulty of the subject itself if the value of their scientific efforts is to be made available for the public good. Those with no sure knowledge to guide them should not be placed into a position of determining research protocols.

The bills proposed before this Subcommittee are legislative actions that would place the review of scientific protocols in hands of individuals not working in the areas involving the majority of the nation's biomedical and behavioral research (H.R. 4406); would increase the Federal budget to develop alternatives methods (H.R. 220 and 2110); and, would distort the biomedical research enterprise by diverting at least 30 percent of the already constrained funds for Federal research to the development of alternative methods which, if initiated, could not absorb such funding effectively (H.R. 556). The ramifications of these proposals must be weighed carefully against the need to protect human life.

In actuality, these bills, if enacted, would place heavy burdens on already depleted agencies which would be incapable of carrying out the intent of the Congress; would require new funding which, if appropriated, could place more restraints on the Administration's efforts for a balanced budget; and, would indirectly increase the overall cost of research which, in turn, would be passed on eventually to the consumer.

What appears to be the bottom line is that any legislative reform to be considered on the behalf of animals and their roles in research should not be either restrictive or inflationary.

The ultimate justification for the use of animals in biomedical and behavioral research and for the appropriation of Federal funds for that purpose is the future of sick people. True, some animal research is not pleasant to watch. But then neither are a severely injured child, open-heart surgery, or terminal patients in a hospital cancer ward.

I thank the Subcommittee for this opportunity to present the views of the National Society for Medical Research and I would be pleased to respond to any questions the panel may want to ask.

Mr. WALGREN. Dr. Melby.

STATEMENT OF DR. EDWARD C. MELBY

Dr. MELBY. Mr. Chairman and members of the subcommittee, I am Edward C. Melby, president of the Association for Biomedical Research. I am also Dean of the Faculty and Professor of Medicine of the College of Veterinary Medicine at Cornell University. Prior to accepting that appointment in 1974 I served for nearly 13 years as Professor and Director of the Division of Comparative Medicine of the Johns Hopkins Medical School.

The Association for Biomedical Research, established in 1979, represents nearly 200 universities, hospitals, medical schools, veterinary schools, research institutes, animal producers and suppliers, pharmaceutical, chemical, petroleum, and contract testing companies. ABR's primary objective is to help assure the continuation of responsible biomedical research.

It is our understanding that we are here today to discuss the use of animals in medical research and laboratory testing.

ABR was established precisely because no private, nonprofit, nongovernmental organization seemed to exist which would interact in a positive way with scientists, animal welfare organizations, science-based industries in medicine and health, universities and research institutions, and Government regulators. ABR has, therefore, in its mere 2 years of existence established lines of communication among those varied organizations and, in a more formal way, met with USDA officials to hold serious discussions on improving the Animal Welfare Act. These efforts are ongoing and have been very useful, we believe.

ABR here wishes to emphasize that it welcomes proposals, questions, and discussions with representatives of any interest in the field of animal use in biomedical research. Surprisingly, no animal welfare organization or humane society has presented any written proposal to us, nor has any legislator sought the views of the constituency ABR represents through contacting ABR. We hope such representations will be made in the future and assure the subcommittee that ABR will respond thoughtfully and reliably to any consultation requested. We offer our services as a sounding board to all concerned with biomedical research.

The subcommittee has expressed an interest in whether laboratory animals are studied unnecessarily or inappropriately. ABR has no reason to believe that in science as in politics or law there is perfection. The difficulty with words like "unnecessary" or "inappropriate" is that what seems unnecessary to one person from one vantage point may seem absolutely necessary to another from a different vantage point. Had a Pasteur or a Madam Curie in France, or a Fleming or a Lister in England, or a Salk or a DeBakey in the United States been prevented from following their studies on vaccines, X-rays, penicillin, antiseptics, polio, or heart surgery because they were judged unnecessary; these advances and concepts so taken for granted would not have been developed as they were. Verification of their results by a certain amount of replication was and is an essential part of the scientific process.

Having said that, it is clear to us that endless repetition and duplication without purpose must be avoided. It is our opinion that the peer review system of the major granting agencies, including the National Institutes of Health, the editorial review process for originality of thought by scientific journals and the cost-effectiveness of private industry prevent most so-called unnecessary animal experiments. Those persons and organizations opposed to all studies of animals will, of course, consider all such studies as unnecessary, a view far from that of the mainstream of America, we believe.

Nevertheless, any improvements which would prevent unnecessary experiments without preventing those which turn out, sometimes quite unexpectedly, to have been very necessary would be welcome. The ABR believes that none of the legislative proposals now in the Congress succeed in making that distinction, but ABR is anxious to work toward that goal.

The use of techniques labeled by some as "alternatives" to animals is as old as chemistry, physics, astronomy, and modern science itself. Recent NIH studies have shown that roughly one-third of its current budget is spent on research using mammals and about one-fourth on research using humans themselves, the remainder being on research which studies neither mammals nor people. In other words, NIH's average yearly support over the last 3 fiscal years for projects which do not involve laboratory mammals constitutes 55 percent of total research dollars expended. Further, in fiscal year 1980 approximately 28 percent of NIH funds were committed to projects using neither humans nor mammals. In dollars this translates into in excess of $704 million. This, combined with the finding that animal use declined by 40 percent in the decade 1968 through 1978 in the United States by a National Research Council, Institute of Laboratory Animal Resources survey which was published in 1980 must be taken by any reasonable person as strong evidence of science incorporating nonanimal techniques as soon as they become scientifically reliable.

So-called alternatives are consistently incorporated into research, education, and testing requirements as the particular medical or scientific field warrants. In addition, the significant pressures of inflation on scientific endeavors have made the acquisition and use of animals increasingly expensive. As a result, universities and private industry have experienced considerable motivation to replace animals with less expensive, nonanimal techniques wherever possible. A significant percentage of industry's research and development budget is dedicated to the search for in vitro techniques as standard procedures. It must be emphasized, however, that the criterion of scientific excellence must remain the principal determinant of any research method. Where appropriate alternatives to the use of living animals have and will continue to be developed, the benefits obtained through their precision and reproducibility certainly make alternatives a most attractive choice. Several of the present legislative proposals before the Congress in respect to these so-called alternatives are therefore redundant and, in our view, dangerous to the conduct of science by the time-tested, scientific peer review process in this country.

The Soviet Union, it should be recalled, has still not recovered in medicine and biology from the period of Lysenkoism when the Government dictated false biological information as a mandated approach to science.

Perhaps one of the most significant steps taken in the past few years was the passage of the Laboratory Animal Welfare Act, Public Law 89-944 in 1966 for it marked a new era in research regulations. Amendments in 1970 as well as subsequently have broadened the act to its present form known as the Animal Welfare Act, and it now protects show horses, zoo and aquatic species, and other categories of animals as well as those used in laboratories. Ironically, the two largest categories of animals in the United States, largest by far, are not covered by the present act—pet dogs and cats and farm animals. It is important to understand this dichotomy perhaps best expressed through citing the numbers of animals involved.

In fiscal year 1980, 188,700 dogs were studied in research in the United States, according to official U.S. Department of Agriculture figures. This can be compared to the over 3 billion, that is, 3 billion chickens raised for food each year in the United States or the 13 million dogs killed each year by public pounds, municipal animal shelters and humane societies, according to reliable estimates. There are believed to be about 35 million pet dogs in the United States at any moment, yet the Animal Welfare Act does not cover them. But think about those numbers, because it is important to put these data into proper perspective—188,700 dogs studied in medicine and science compared to over 13 million killed as unclaimed, unwanted dogs each year by towns and cities across America.

The appropriate care, acquisition and maintenance of laboratory animals is of continuing interest and concern to all responsible scientists. ABR therefore supports efforts to amend those components of the Animal Welfare Act in need of improvement. Indeed, ABR would recommend extension of the present act's coverage to pet dogs and cats and those in municipal pounds or animal shelters whose municipalities or owning organizations receive Federal funds. ABR would be pleased to interact with congressional sponsors of bills related to animal welfare to insure participation of the larger biomedical community, including the major research and teaching organizations and research-based industries of America.

We would be pleased to respond to any questions or comments you may have and hope that Members of the Congress or their staff will contact our office at anytime information from the biomedical perspective is required.

On behalf of the Association for Biomedical Research I would like to thank you for this opportunity to comment on these important issues.

[The statement of Dr. Edward C. Melby follows:]

ASSOCIATION FOR BIOMEDICAL RESEARCH

Mr. Chairman, Members of the Subcommittee, I am Edward C. Melby, Jr., President of the Association for Biomedical Research. I am also Dean of the Faculty and Professor of Medicine of the College of Veterinary Medicine at Cornell University. Prior to accepting that appointment in 1974, I served 12 years as a Professor and Director of the Division of Comparative Medicine of the Johns Hopkins University School of Medicine.

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It is our understanding that we are here today to discuss the use of live animals in medical research and laboratory testing. Perhaps one of the most significant steps taken in the past few years was the passage of the Laboratory Animal Welfare Act, Public Law 89-544, in 1966, for it marked a new era in research regulation. Amendments in 1970 as well as subsequently have broadened the Act to its present form known as the "Animal Welfare Act" and it now protects show horses, zoo and aquarium species, and other categories of animals as well as those used in laboratories. Ironically, the two largest categories of animals in the United States - largest by far - are not covered by the present Act; pet dogs and cats, and farm animals. It is important to understand this dichotomy perhaps best expressed through citing the numbers of animals involved. In FY 1980, 188,700 dogs were studied in research in the United States according to official U.S. Department of Agriculture figures. This can be compared to the over three billion - that is three billion - chickens raised for food each year in the United States or the thirteen million - that is thirteen million - dogs killed each year by public pounds, municipal animal shelters, and "humane" societies, according to reliable estimates. There are believed to be about 35 million pet dogs in the United States at any moment, yet the Animal Welfare Act does not cover them. We will return to this point in a moment. But think about those numbers because it is important to put these data into proper perspective; 188,700 dogs studied in medicine and science compared to over thirteen million killed as unclaimed, unwanted dogs each year by towns and cities across America.

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Having said that, it is clear to us that endless repetition and duplication without purpose is to be avoided. It is our opinion that the peer review system of the major granting agencies, such as the National Institutes of Health, the editorial review process for originality of thought by scientific journals, and the cost effectiveness of private industry, prevent most so-called "unnecessary" animal experiments. Those persons and organizations opposed to all studies of animals will, of course, consider all such studies as "unnecessary" - a view far from that of mainstream America, we believe. Nevertheless, any improvements which would prevent unnecessary experiments without preventing those which turn out, sometimes unexpectedly, to have been very necessary, would be welcome. The Association for Biomedical Research believes that none of the legislative proposals now in the Congress succeed in making this distinction, but ABR is anxious to work toward this goal.

The use of techniques labelled by some as "alternatives" to animals is as old as chemistry, physics, astronomy and modern science itself. Recent NIH studies have shown that roughly one third of its current budget is spent on research using mammals and about one fourth on research using humans themselves, the remainder being in research which studies neither people nor mammals directly. In other words, NIH's average yearly support over the last three fiscal years for projects which do not involve laboratory mammals constitutes 55% of total research dollars expended. Further in FY 1980, approximately 28% of NIH funds were committed to projects using neither humans or mammals. In dollars this translates into $704.8 million. This, combined with the finding that animal use declined by 40% in the decade 1968 through 1978 in the United States by a National Research Council-Institute of Laboratory Animal Resources survey published in 1980, must be taken by any reasonable person as strong evidence of science incorporating non-animal techniques as soon as they become scientifically reliable. So-called "alternatives" are consistently incorporated into research, education and testing requirements as the particular medical or scientific field warrants. In addition, the significant pressures of inflation on scientific endeavors have made acquisition and use of animals increasingly expensive. As a result, universities and private industry have experienced considerable motivation to replace animals with less expensive, non-animal techniques wherever possible. A significant percentage of industry's research and development budget is dedicated to the search for in vitro techniques as standard procedures. It must be emphasized, however, that the criterion of scientific excellence must remain the principal determinant of any research method. Where appropriate alternatives to the use of living animals have and will continue to be developed; the benefits obtained through their precision and reproducibility certainly make alternatives a most attractive choice. Several of the present legislative proposals before the Congress in respect to these so-called "alternatives" are therefore redundant and, in our view, dangerous to the conduct of science by the time-tested, scientific peer review process in this country. The Soviet Union, it should be recalled, has still not recovered in medicine and biology from the period of "Lysenkoism" when the government dictated false biological information as a mandated approach to science.

The appropriate care, acquisition, and maintenance of laboratory animals is of continuing interest and concern to all responsible scientists. ABR therefore supports efforts to amend those components of the Animal Welfare Act in need of improvement, to which I referred earlier. Indeed, ABR would recommend expansion of the present Act's coverage to pet dogs and cats, and those in municipal pounds or animal shelters, whose municipalities or owning organizations receive federal funds. ABR would be pleased to interact with Congressional sponsors of bills related to animal welfare to insure participation of the larger biomedical community, including the major research and teaching organizations and research-based industries of America.

We would be pleased to respond to any questions or comments you may have, and hope that members of the Congress or their staff will contact our office at any time information from the biomedical perspective is required.

As part of these hearings, we wish to offer specific comment on four bills (HR 556, HR 4406, HR 930 and HR 220) now under consideration by the Subcommittee on Science, Research and Technology. For purposes of clarity I list these according to the specific points identified by the Committee for review:

1. Excessive, unnecessary, uneconomic or inappropriate use of animals in current practice:

Biomedical research institutions in this country operate under a peer review system comprised of before-the-fact reviews of applications and subsequent reviews of data and results in scientific meetings as well as by reviewers and editors of scientific journals. In 1966 the Animal Welfare Act (Public Law 89-547) was enacted. At about the same time, the scientific community sponsored an independent, peer review accreditation program under the auspices of the American Association for Accreditation of Laboratory Animal Care which now accredits some 440 institutions. Institutions now follow guidelines prescribed by the NIH Office of Protection of Research Risks, and a signed statement by each investigator is prepared in making application for research funds that principles for the proper use of animals are being followed.

According to studies carried out under the auspices of the National Academy of Sciences-National Research Council, reported in 1980, there was a 40% decrease in total animal use in the decade 1968 through 1978. Although the reasons are varied, there is good evidence to indicate that the supply and use of healthier animals has reduced loss as well as variation in results and hence, reduced the need for confirmation through repetitive studies. Additionally, there has been the ongoing process of incorporating "new technologies" including tissue culture, computer modeling, in vitro diagnostic and assay instrumentation and, most recently, the advent of recombinant DNA techniques. This has been an ongoing process. For example, records of the College I head indicate that tissue culture techniques were introduced on this campus in the mid-1940's. The very nature of science requires that such new technologies be implemented as soon as they are demonstrated to be the equal or superior to existing techniques. Furthermore, economic pressures require that more effective substitutions be introduced wherever possible.

2. Ways to promote more humane and appropriate use of animals, including alternatives to animal use:

Concurrent with the enormous expansion of biomedical research following World War II, the scientific community has made a major commitment to the improvement of laboratory animal science. Indeed, an entirely new area of scientific specialization and the infrastructure to support it, has evolved to meet that need. Training programs have evolved in both the two and four year colleges to train animal technicians and technologists; a new specialty board recognized by the American Veterinary Medical Association, the American College of Laboratory Animal Medicine, certifies veterinarians with advanced training and experience in that specialty; and most institutions provide in-house training programs for animal technicians and graduate students, many following the programs fostered by the American Association for Laboratory Animal Science. Through these and related efforts the personnel directly involved in the care and use of laboratory animals have gained significant understanding of the humane care and specialized requirements of the various animal species used.

I believe it is important to repeat observations made earlier in this testimony. So-called "alternatives" are consistently incorporated into research, education and testing requirements as the particular medical or scientific field warrants. In recent years, the significant pressures of inflation on scientific endeavors have made acquisition and use of animals increasingly expensive. As a result, universities and private industry have experienced considerable motivation to replace animals with less expensive, non-animal techniques wherever possible. It must be emphasized, however, that the criterion of scientific excellence must remain the principle determinant of any research method. Where appropriate alternatives to the use of living animals have been developed, the benefits obtained through their precision and reproducibility certainly make alternatives a most attractive choice. Both HR 930 and HR 220 have been written in such a manner as to be a constructive force and we generally support that approach.

3. Incentives for development of more and improved alternatives to animal use:

The object of all research must be that of uncovering facts and truths, regardless of the approach. In science there are enumerable "incentives for excellence and accuracy", including various awards, recognition by learned societies, research grant support, authorship of books and scientific papers and perhaps most importantly, the acceptance and recognition of one's peers. As mentioned previously, alternatives to animal use have continually been developed, accepted and implemented based upon scientific validity, improvement of effectiveness, cost reduction and efficiency. It is questionable whether or not additional "incentives" can really be granted to stimulate the development of meaningful alternatives to animal use, especially if this is carried out without reference to whether or not such methods are scientifically useful in the understanding of human or animal disease or for predicting safety or drugs.

If the approach necessitates the use of animals, the scientist must be sensitive to the animal's requirements. It is our belief that the continuing progress of scientific knowledge will continue, as it has in the past, to recognize, develop and implement such alternatives without artificial stimulants.

4. Responses from academic, private and public research institutions to problems raised by pending legislative proposals:

In reviewing the several bills now before the Congress, two are particularly worthy of comment. HR 556 is, in our opinion, an intrusion into the scientist's ability to use a wide variety of approaches based upon experience, experimental design and intended objectives. To artificially require deviation from accepted scientific principles would create a situation not unlike the Lysenko era in the Soviet Union. As presented, the bill would mandate a wholesale diversion of 30% to 50% of all federal research funds from existing, peer reviewed projects, thus jeopardizing the entire scientific research program of the nation. As objectionable as that mandate might be, the fundamental issue with the approach taken by the bill is that it fails to recognize innovative and creative scientific inquiry, mandating restrictions on what have proven to be the most fruitful approaches to biological and medical research since the advancement of the germ theory of disease.

HR 4406 proposes to amend the existing animal welfare act in a number of ways. Perhaps of greatest concern is the attempt to modify section 3(a) which would attempt to define "pain" in animals. It has been clearly demonstrated that the concept and interpretation of pain is exceptionally complex and clarification is not amenable by the sort of definition proposed. In secion 10, we object strongly to the recommendation that inspectors be given authority to "confiscate or destroy" animals which, in the sole judgment of the inspector are "suffering as a result of failure to comply with any provision --" unless the institution's animal care committee is convened. In the day to day working situation of a complex institution such as the University I serve, such a provision for the convening of a committee for immediate action is clearly fraught with impossible problems. Furthermore, the scientific qualifications of individual "inspectors" is and will probably always remain a questionable aspect.

5. Areas in which animal-based research or testing remains crucial to protection or enhancement of human health:

This topic must be addressed in a variety of ways and to adequately respond to the question would require a voluminous amount of data. I will, therefore, limit my observations but would be pleased to provide members of the Committee with additional information should that be helpful.

In the area of infectious disease, prior to advances in chemotherapy and vaccines, such diseases were the cause of most deaths in the industrialized world. Today, many have been reduced to the point where infectious disease ranks among the lowest causes of death. Biologic production and testing has always been dependent on animal use since only the complex, biologically interrelated systems of the whole animal can respond in a fashion indicative to that of man. Certain aspects of testing have been delegated to "alternatives" and where proven efficacious, these practices will continue and expand. Similarly, the toxic effects of many antibiotics and other chemotherapeutic agents have first been recognized through their application in animals. This method of testing is the only one endorsed by the FDA for human use and the USDA for animal use, for no acceptable alternatives currently exist which embody the total host response provided by animals. Relatively recent examples of the importance of such testings and the use of a variety of systems are found in the development of polio vaccine and the identification of thalidomide as a teratogen.

In the underdeveloped countries, many infectious diseases still account for tremendous morbidity and mortality. According to the 1980 World Health Organization Summary Reports, 200 ,000,000 people are affected by schistosomiasis; 100,000,000 by leishmaniasis with 400,000 new cases developing annually; 300-400,000,000 cases of malaria which kills in excess of 1,000,000 children each year, and, 100,000,000 humans are affected by trypanasomiasis. It is estimated that the morbidity from these four diseases alone is four times the entire population of the United States. At the present time, there are no alternatives to the use of animals in demonstrating the host response to these infectious agents. Any severe reduction in the use of animals to continue important studies on these diseases, aimed at treatment and prevention, would severely impede the progress being made by many U.S. research institutions, including Cornell, thus prolonging the suffering and death of millions of humans throughout the world.

In the United States, hepatitis B infection remains an important cause of death and illness. Recent evidence indicates that infected individuals demonstrate a very high rate of developing cancer of the liver in later life. Outside of the United States, hepatitis is a major contributor to human suffering. At the present time, Cornell University, under contract from NIH, is developing an important animal model for hepatitis B virus research and vaccine testing using the feral woodchuck, _Marmota monax_. Should attempts be made to eliminate the use of this or other valuable animal models for hepatitis B research, it will severely impact the ability to develop a protective vaccine for man.

In spite of significant progress in treatment and control, leprosy remains a major world-wide disease with many cases occurring here in the United States. To date, the only method for studying the growth and establishment of infection of the causative agent is through the use of the armadillo. Continued research in this disease will be dependent on the use of this animal model.

The above examples are directed to human disease, yet it is important to recognize that millions of domestic animals are saved in the United States each year through the use of prophylactic vaccination. Recent United States Department of Agriculture figures show that in 1970, for every 10,000 poultry sent to slaughter, 158 poultry had Marek's Disease. In 1979, as the result of the development of a new vaccine, the incidence of Marek's Disease was reduced to 11 cases per 10,000 poultry. As an example of other control measures, in 1950, there were 1.4 cases of hog cholera per 10,000 animals. In 1979, this figure was reduced to zero. Hog cholera has been virtually eliminated. In 1950, there were .86 cases of cattle tuberculosis per 10,000 animals slaughtered. This disease is transmissible to man. In 1979, cattle tuberculosis was reduced to .008 cases per 10,000, thus decreasing the prevalence of this disease by 1000-fold. A significant number of vaccines used in control of diseases of animals were developed and tested at Cornell University, the most recent being the canine parvovirus vaccine to protect against a new disease which simultaneously occurred in several parts of the world in 1978. Recognizing the tremendous number of dogs lost to this disease since 1978, and the significant distress this brought to animal owners, we question the wisdom of mandating discontinuing the use of living animals in such research.

In the area of non-infectious disease, the major cause of mortality in the United States is that of diseases associated with the cardiovascular system. During the past three decades, animals have played an instrumental role in the development of new surgical, therapeutic and electronic devices which have played an enormous role in decreasing both mortality and morbidity. As an example, it is estimated that 50,000 coronary bypass operations take place annually in this country, thus relieving thousands suffering from pain and for many, prolonging their lives.

Cancer ranks second, after cardiovascular disease, as a cause of death in America. Tremendous advances have been made in cancer chemotherapy and the public is just recognizing that permanent cures are now possible for many forms of cancer. Granted, much remains to be done in solving the ravages of this disease, but I must point out that all chemotherapeutic agents have first been tested in animals for signs of toxicity. Indeed, animals remain the key for further progress in our conquest of cancer.

Other diseases of significance in the United States have likewise benefited from animal experimentation. Animal "models", or those animals in which similar if not identical disease syndromes exist, obviously represent a fertile source of investigation. In many instances, the information gained can be of direct benefit to the animal populations involved, thus preventing death or improving the quality of their lives. As examples, one can cite spontaneous systemic lupus erythematosus, rheumatoid arthritis, and hemolytic anemia. In the field of endocrinology we have benefited immensely from the use of animals to delineate the growth changes and bodily responses altered through disorders of the endocrine system. Such studies have shed new light on diseases such as thyroiditis, pituitary giantism, Cushing's syndrome, Addison's disease, and many others. The isolation, purification, testing and synthesis of a number of hormones have significantly influenced the lives of millions. Again, because of the complexities of the systems involved, only living animals manifest the full range of physiologic changes needed to develop, test and produce such compounds.

In diseases of the central nervous system, significant advances have been made in products such as lithium for patients with manic depression. At the present time, investigators at Cornell are testing several new synthetic lithium compounds in animals which promise to bring beneficial therapeutic effects without the severe toxicity currently encountered with the parent compound.

Chronic debilitating diseases, such as rheumatoid and osteoarthritis, have benefited greatly from animal research. During the past two decades, surgical procedures developed in animals have led to the production and implantation of total hip joint prosthetic devices, knees, and other bone replacements in man. Such devices have provided pain-free locomotion in thousands of Americans who were previously immobile.

The examples cited above are chosen merely to illustrate the importance of animal experimentation to relieve pain, suffering and death in both man and animals. The listing is representative of only a small portion of those diseases and disorders in which animals have made useful contributions to human medicine; most were selected because they are currently used or are under study at Cornell University; thus, I have personal knowledge concerning this work.

The Subcommittee should also be aware of the fact that, since World War II, there have been 52 Nobel Prize winners in medicine and physiology. Thirty-seven of these awards were achieved with NIH grant awards. We have had 21 Nobel Prize winners in chemistry; twelve of these received NIH support. Within the past few days, this year's Nobel Prize recipients were announced. Their scientific observations and discoveries were made by utilizing animal models - non-human primates. The science being conducted in this country is perhaps the finest in the world. Congress must strive to preserve the right of scientific freedom to insure continued creativity and excellence.

In this correspondence I have intended to be informative, yet to constructively criticize the various bills currently before the Subcommittee on Science, Research and Technology. We are aware that under certain conditions our research animals are subjected to painful procedures, yet we do everything possible to minimize the number of such procedures and to use drugs to abergate pain. Rest assured that we agree that alternatives to living animals should be employed whenever appropriate and that science will continue, as it has in the past, the development of new alternative methods. It is our opinion that enactment of HR 930 or HR 220 would promote such alternatives without disrupting biomedical research. We wish to emphasize to the Committee the signficant past achievements in biomedical science, many of which have been accomplished through the use of living animals, and stress the importance of their use in ongoing and future studies. Attempts to reduce the use of animals through restrictive legislation or through the imposition of unnecessary bureaucratic authority which extends beyond the time-tested, peer review system, would seriously impede efforts to improve the lives of both man and animals.

On behalf of the Association for Biomedical Research, thank you for permitting me to comment on these issues.

Mr. **Walgren**. Thank you very much, Dr. Melby. We appreciate those statements.

Mr. Brown.

Mr. **Brown**. Gentlemen, I want to commend all of you for what I consider to be very well done statements, factual and noninflammatory, and I think they will help us to address the problems here in the most constructive way.

In looking for suggestions as to what could be done to maintain the progress which I think is being made in this field none of you gentlemen have been enthusiastic about the legislation that we have before us. We have had some other suggestions, including for example, the spokesman for NIH indicated that they were already taking steps to improve the inspection processes and the documentation processes with regard to research grants.

I would like to inquire if you find any problems with these steps already being taken. Also, would you find any problems with a proposal which was made by one of the other witnesses that possibly the processes that we are talking about here, including the animal care committee within the laboratory should include a lay person concerned about the welfare of animals. Would that be an insurmountable problem within the kind of research facilities that you gentlemen are associated with?

Dr. **Melby**. Congressman Brown, let me attempt to answer that. We are dealing with a very complex issue. This is a changing world we live in. I like to use the analogy sometimes that although we can get between here and Baltimore with a car with running boards very few of us drive such vehicles any more. And so it is I think in biomedical research, that conditions indeed have been changing in the amount of time in which I have been involved, for which constitutes the greatest percentage of my professional life, enormous changes have taken place.

And I like to characterize it as a process, for as I talk with my colleagues who are in this business or have trained others who deal with these issues, we are basically educating the educated.

It is a continuous process for I am suggesting that scientists or those involved in the scientific endeavor are not as a group trying to be inhumane or anything of that sort. Some individuals may be; I am not suggesting that all are lily white by any means, but it is a constant process of trying to inform them about what it is that goes on in biological processes and improve their understanding. And indeed improvements have been made, and continue to be made.

The concern I would express as it relates to the suggestion of placing laymen on committees is one of a bit of skepticism, primarily due to other experiences I have had with this same approach in placing laymen on boards for educational reviews, professional licensing boards, et cetera, as it relates to the professions. It has been a very difficult process in my experience, dealing with lay people in order to bring them up to a stage of understanding the language, the education, and scientific environment.

It seems to me that one of the significant things that is now going on throughout the scientific community is the self educational process created through the peer pressure that is being exerted through a variety of ways, for this has brought enormous improvements. And that doesn't mean that improvements can't continue to be made, for this is a continuing process. I can assure you, sir, that changes are indeed taking place through the various committees that are formed, the peer review processes, and various educational programs which I believe are achieving their objectives.

Dr. **Wolff**. Mr. Brown, if I might in just one moment carry you through what would happen if I today decided I wanted to do a particular project involving an animal at our institution.

I would write a grant application, and I would submit it for approval from the appropriate authorities at our institution, which would include an animal care committee made up of representatives of the dental school, the school of veterinary medicine, and the school of medicine. If they then approved it and it was signed by our dean, it would go to a study section in Bethesda made up of a large group of our peers, and if they then approved it it would then go to the council of that institute. If they then approved it I would be funded to do the research.

If the research were repetitive or unnecessary I doubt if it would pass that process.

When it got then to the point where I had results I would submit it for publication where again a group of our peers would review this for its scientific value, and there are instances that I know of where papers have been rejected because the reviewers felt that the use of animals or human beings was unethical or the studies were poorly designed. I think less and less of that is happening. And I think that, one of the things I am struck by in the testimony today is that we are hearing about serious cases of abuse, but in my experience in over 20 years they are relatively few, sir.

And I would submit that the overwhelming majority of situations are in fact not unethical.

Dr. **Jordan**. Mr. Brown, the AIBS is laudatory of the efforts of the NIH to increase the focus on documentation and screening, and at my institution it is normal for lay persons or at least those not directly experienced in the kind of research being reviewed to be a participant. In fact we think it is a fundamental way of keeping the records and the documentation clean with respect to the university and the way it does its research.

We have as a part of our animal care committee a member of the department of philosophy who is engaged in the teaching of animal ethics at Colorado State University, as well as veterinarians, among which is the past president of the American Veterinary Medical Association.

We think that makes a good team. The emphasis therefore is placed on documentation and institutional responsibility, which is the position of AIBS.

Mr. **Knobil**. I believe, Mr. Brown, that if the currently extant rules and regulations and laws were enforced just a little better than they already are we would make large strides toward the directions that all of us wish to pursue. They are far from that, for a variety of reasons, not the least of which is inadequate funding and inadequate support personnel, as Mrs. Stevens has pointed out.

With reference to your specific question regarding the membership on animal care committees of lay persons I have no personal problem with that. But I would like to remind you that within a university community, even within the smaller community of a medical school there is a complete spectrum of views and of sensitivities about the performing of animal experiments.

I remind you that Dr. Glass, who testified earlier, works on the same floor on which we have our laboratories. And if the animal care committees are representatives of the faculty I think you will get all of these inputs. But I think it is important to emphasize that the institution, which is really a community of individuals, of physicians, of scholars, of scientists, must have responsibility and accountability for the quality of the animal care within it. That cannot be delegated solely to outside inspectors.

Mr. **Brown**. I think it is clear to all of us that the proliferation of rules, of paperwork, of committees, of regulations of all kinds is probably not the answer to this problem. It consists of making an imperfect human system work better.

One thought that has occurred to me is that you gentlemen in your own educational activities and publication activities perhaps should make some sort of an effort to reflect the thinking of those who are strongly opposed to animal research, and they on their part should perhaps make an effort to reflect some of the thinking of the humane experimenters who feel that it is absolutely essential to continue to have animal research. Then perhaps both groups could come closer to understanding what the other group thinks, and we might make some progress in this fashion toward mutually acceptable goals.

Because I am sure there are goals which are shared by all parties here, that are common to humanity in general I think.

Mr. **Knobil**. It is a point very well taken. I am pleased to say that there is movement in this direction, and next month in this city there will be a symposium on the ethics of animal experimentation, wherein the members of the scientific community and the animal welfare community will participate, both in formal presentations and in discussions. I, for one, will be a participant in that meeting.

Mr. **Brown**. That is helpful, and then, of course, the development of the science of nonanimal research, the alternatives to animal research is a legitimate field in itself. The understanding of the mechanisms which exist in the human body has to replace some of the sort of blindfolded experimentation we are doing. If we knew the mechanisms we would not have to do the experiments. And we need ways to move in that direction as one of the goals of science.

I might say, several of you gentlemen and others have referred to the attitude which I think you may feel exists in this committee as sort of a dogmatism comparable to Lysenkoism.

Lysenko was a scientist, purported to be, and the problem is frequently that scientists are just as dogmatic and desire to repress things that do not agree with their dogmatism as politicians are, and that should be kept in mind as we seek to open up our understanding of other ways of thinking.

Mr. **Walgren**. Thank you, Mr. Brown. Do any of you have reactions or comments?

Dr. **Jordan**. Mr. Chairman, I suppose the only reaction is to say it has to be so, and we do get caught up in our efforts, and I think that is one of the values of having lay persons involved to some extent.

Now, of course, it would depend upon the quality of the background of that person. They could be helpful or a hindrance to the system, but it can work pretty well.

Dr. **Levey**. Thank you, Mr. Chairman.

May I make comment?

Mr. **Walgren**. Oh, yes.

Dr. **Levey**. I think it needs to be emphasized that all of us are concerned with humanism. It has developed in medicine to a degree now that we probably have not seen before. Also, a number of times this morning reference has been made to the European approach to animal experimentation, and if the committee is going to explore that, I think a good deal of research needs to be done, since in Europe there is a peculiar tendency toward protection of animal rather than human life. It should be noted that there have been much greater incidences of drug misfortunes in Europe than there have been in the United States.

The United States has created institutional review boards for the protection of humans, and animal care committees for the protection of animals; I think that we do have our priorities straight, and I would certainly urge the committee to try and continue this path.

Mr. **Walgren**. Mr. Weber.

Mr. **Weber**. Thank you, Mr. Chairman.

Dr. Levey, in your testimony you listed a partial catalog of medical problems that have been addressed successfully, with varying degrees of success by experimentation on live animals. I believe you mentioned hypertension, coronary bypass, transplants, pacemakers; Dr. Knobil mentioned polio vaccine, thalidomide. In any of your testimony, or in documents that you could make available to the committee, have you made an attempt to catalog all the advancements that have been made in medical science in the recent past, partially as a result of experimentation on live animals?

The reason I ask the question is, and I want to explore this a little with you, too, is that some of the testimony that we have heard in the last couple of days suggests that there has been no necessity for such experimentation and no breakthroughs as a result of it that could not have been accomplished otherwise.

Dr. **Levey**. I have not attempted to make any rigorous computation, but I think that it is almost impossible to take major advances which we have mentioned and apply them directly to humans without animal experimentation. Particularly if you take the surgical fields—every surgical technique has been perfected in animals. One cannot construct an artificial system where one could practice what was being done and then apply it directly to humans. I think that goes without saying.

I don't agree with the logic this morning that the reason there have been human advances on the basis of animal experimentation has been because we have operated on animals, therefore the advances are applied. You can't operate on a bacteria, you can't operate on a model. One has to operate on a living organism.

And I think that the advances which we have seen have required animal experimentation. I don't think one could circumvent that.

I might add, also, that the Food and Drug Administration has created for the United States the safest system of drug development known in the world. I think this committee would have to talk to the Food and Drug Administration. I think we have to be proud of that system, and it has made life very difficult for experimenters dealing with human research, but I think it has been the wisest course.

We can't go from the test tube to humans; you have to go from the in vitro systems to animal systems, both in vitro and intact before one even dares to go to a human system. And I think it is wise, and I think it is safe, and I think it has been necessary.

Mr. **Weber**. Thank you. Just looking at one of the specific areas, the use of coronary bypass operations, are you saying categorically that those advancements would not have been possible without experimentation on animals?

Dr. **Levey**. Yes.

Mr. **Weber**. Would anyone on the panel disagree with that?

Dr. **Levey**. No.

Mr. **Knobil**. Categorically, yes.

Mr. Weber, if I may comment, I think the testimony which we heard earlier today about the inefficacy of research was in a behavioral area, where one panel member said that none of the behavioral research helped us understand human behavior any better. And I think we have to remain cognizant of the great multiplicity and heterogeneity of the scientific enterprise, and take that into account when the prime measure is of the kind that you request.

Dr. **Melby**. Mr. Weber, in our written testimony there is the type of documentation that you have just requested, although it was selective, and we can make it much more voluminous if you——

Mr. **Weber**. Fine. I will review that.

Dr. **Wolff**. I would just like to add that what differentiates modern medicine, at least in our country from what we had before, is technology. I don't know of any technological advance in modern medicine that could have been possible without animal experimentation first.

Mr. **Weber**. Thank you.

Dr. Wolff, I know that you are a biological researcher, but from looking at the logo on your association's letterhead, it also deals with behavioral research, I believe; is that not correct?

Dr. **Wolff**. No. I have done no behavioral research.

Mr. **Weber**. I see. Well, I just wondered if there is anybody on the panel who can respond to that, because the past panel seemed to put a heavy emphasis on the lack of usefulness of animals in behavioral experiments. Does anybody on the panel care to comment on whether or not we can do without that?

Nobody here. I see. All right.

Dr. **Jordan**. I guess I would suggest to the subcommittee, don't accept an "all or none" kind of statement from any of the witnesses. Don't accept the proposition that all of it is bad or all of it is good, that the scientific community should not and cannot be held accountable or that every scientist in his own design or her own design is going to have a perfect experiment. None of those things are right, and so I think the truth of the matter is that it is important in behavioral research. It isn't important in all behavioral research, and in all cases it isn't justifiable, but it certainly is necessary at times.

Dr. **Melby**. I think, Mr. Weber, you have a panel where none of us are trained or experienced in behavioral research. As someone who is not it seems to me, though, that to condemn all behavioral research based on animals would be a serious mistake. Just think about the advances that have been made in the understanding of human behavior—and animal behavior I might add—which have very important implications in the control of the problems we face in mental institutions which had their basis on the development of these approaches.

I would suggest that we need someone to speak more from that area of knowledge than you have here before you today.

Mr. **Weber**. Dr. Wolff, on page 12 of your testimony you say that scientists should be allowed to continue their work for the benefit of all and without hindrance over and above the difficulty of the subject itself if the value of their scientific efforts is to be made available for the public good. That is a fairly absolute point of view which, you know, counterpoints with some of the other absolutes that we have heard in the last couple of days.

I wonder, though, if you are concerning yourself there only with technique that will be used in the experiment, or if you are actually referring to the care of the animals and some of the other things that this committee will be addressing.

It seems to me, I understand your point of view when you talk about regulation, if you will, of the experimental techniques that a researcher might use, but are you also saying that the general care of the animals in a laboratory surrounding is not a proper subject for inquiry?

Dr. **Wolff**. If it came out that way I did not intend it that way at all.

I think that the animal care groups, such as we have in our institutions, have it as their responsibility and it is not only the responsibility of the investigator.

Mr. **Weber**. Do you believe that lay persons should be on the animal care committee?

Dr. **Wolff**. I do not believe they should be. That doesn't mean that if they were it would necessarily detract, but I don't think that it is necessary.

Mr. **Weber**. I see.

Dr. Melby, I am sorry to prolong this, it will probably be my last question.

You referred to the unexpected results that are often beneficial from much of the experimentation that has gone on. I do not recall the exact context, but one of the things that was touched upon by a number of the people when they gave testimony, particularly yesterday, was in relationship to the Maryland incident. It was stated that they were simply looking for something interesting to happen. A good deal of our discussion has gone forward concerning research which is not properly goal-oriented.

I wonder if you can talk about that, because it seems to me to be central to setting up any kind of a regulatory apparatus that will deal with experimentation on animals.

Is it possible to set up a regulatory milieu which requires that research always be guided toward a specific end, or are these unexpected results that you referred to integral to the whole concept of research?

Dr. **Melby**. Well, I think perhaps we are dealing with semantics. What I was referring to in terms of unexpected results is related to trying to develop or perhaps separate what is commonly known as basic research from targeted or applied research.

Applied research basically has a definite known end point we want to reach, and we set up the various procedures to reach that goal.

Basic research may be considered the search for knowledge itself, without any known application, if you will, but that's a very simplistic way to define it.

I believe if addressed in terms of, wandering around in the scientific world, not knowing where you are going and hoping maybe something will pop out, that is not the way research is done.

What I was really referring to is that in the trained scientific approach where you are following normal procedures and looking at a particular problem sometimes quite unexpectedly other things develop that you had no way of predicting and these become enormously important and are often far more important than the area of research that you had originally embarked upon. I can give you many, many examples of such situations.

In our own school quite recently a scientist who was looking at a particular problem of urolithiasis or blockage of the urinary tract came upon an observation, in this case in tissue culture which is an animal alternative, which, combined with some experience she and her scientist husband had with animal model systems, in this case chickens, has made some profound observations in terms of the possible etiology, or cause, of atherosclerosis in man.

That is what I was referring to in terms of unexpected results coming out of a particular problem.

Mr. **Weber**. I see.

I have no more questions, Mr. Chairman.

Mr. **Walgren**. Thank you, Mr. Weber.

I certainly appreciate the perspectives given by you members of the panel.

Do any of you have the feeling that the peer review system could perform better in this area? The example of the laboratory in Silver Spring was one where on one view the peer review system really did not work; it was a review by, or the only people that saw it were inside associates. That is not what I generally associate with the word "peer," and in fact "peer" really in the legal sense implies an independence and an outside perspective. A jury of our peers are not people who live in our shoes but rather live in our society.

Are there any suggestions that can be made for the peer review process that would, perhaps assure us, and by that instance catch the individual times when the system fails, as in the Silver Spring incident?

Now I notice Dr. Jordan is willing to recommend that general research on animals be treated as carefully as research on human beings is, where we have a real requirement of an outside veiwpoint.

Is there some way that we could improve the peer review process that we now use that would improve this area? And you have two levels, you have the animal care committees, the ongoing treatment, and then the level of approvals of research design. Can you comment on that?

Dr. **Wolff**. Mr. Chairman, when you say really sure, the only thing that I know that would detect something like this would be a site visit of each grant application in which animals were going to be used. Otherwise the peer review occurs at a distant site, and you only take the word of the individual applicants and you assume until proven otherwise that they are honest.

But at the present time if we say that the NIH is trying to maintain 5,000 initiated or investigator-initiated research proposals that would mean if 50 or 40 percent are involved in the use of animals that we would have 2,500 perhaps, grants to site-visit each year perhaps, or even every 2 years.

The NIH is having a great deal of difficulty finding the people to do the site visits right now, and so that the system wouldn't really be peer, because to busy scientists who have to spend now about 25 percent of their time writing grant applications every year to try to get money and then do other things like see patients, to try and again support themselves because of the decrease in extramural funding, this would become not only an onerous but I think impossible task. The whole quality of the peer review system would suffer greatly if one were expected to make a large number of site visits each year.

Mr. **Walgren**. Do the other gentlemen share that extreme reservation?

Dr. **Jordan**. I think from my point of view, I think it can be strengthened. I think the documentation can be provided, the state of the commitment of the institution and the institutional system used can be examined, and perhaps instead of examining each and every proposal one in fact can take a look at an institutional commitment.

Let me be specific in how that can be translated, too. We are talking here about proposals that come to a national agency, and that does increase the size and scope of the problem, but for my organization, the Experiment Station, we do have on-site peer review involving people external to the organization that is being reviewed. It didn't always include lay persons as well. The review system looks at the scientific quality.

What we have discovered is that it increases markedly the competitive position of the institution in Federal grants as well. We have just about quadrupled our grants in the last decade on the basis of the percentage, the batting average, if you will, of proposals submitted. And I suggest that it is due to the fact that we have tightened up our ballgame.

Mr. **Walgren**. Dr. Melby.

Dr. **Melby**. I was not present yesterday, unfortunately, so this may have been already discussed. In the event it wasn't, there is a peer review program which was started in the early or mid-1960's, prior to the animal welfare legislation, by the scientific community. The program is called the American Association for Accreditation of Laboratory Animal Care—AAALAC—which is an independent, nonprofit, voluntary, organization.

I was very much involved in that program a number of years ago and spent a great deal of time with it because I felt very strongly that it was performing a very important service to science as well as to the public of this Nation.

Their standards for review of facilities and animal care programs, including review of management, are very stringent. They basically follow the guidelines of the National Institutes of Health, published in the NIH "Guide for the Care and Use of Laboratory Animals," which go well beyond the existing animal welfare laws and those followed by the USDA. They are much more stringent. I believe there are some 400 to 440, institutions in this country that are now AAALAC-accredited. These are obviously of different size and magnitude.

But I would guess, although I haven't looked at this recently, that the vast majority, percentagewise, of research animals are now covered by AAALAC accreditation.

Having been very much involved with that program, I have seen enormous changes take place in institutions as they try to develop the ability to withstand an AAALAC-accreditation site visit. Furthermore, institutions continually strive to remain AAALAC-accredited, for it is a continuing review process of assurance.

As an example, in an AAALAC-accredited institution, if we knew they lost a key individual such as a director of the program, and there is a great deal known about each program, AAALAC would go back and find out what that institution is doing about it and how are they getting along until they find a replacement.

I believe the AAALAC program has worked very, very well.

One of the urgent problems, unfortunately, and this is true in so many areas, is financing. Within the National Institutes of Health, most of the support for the development and refurbishment of animal research facilities has been provided through its Division of Research Resources and to a lesser degree through the National Cancer Institute which has provided limited construction funds. These programs are the only means by which NIH can provide assistance for improving animal facilities, and their funds, along with many others, have been seriously eroded, not only by inflation but also by the fact that they do not represent the disease of the month, and therefore do not get very high priority on the part of the Congress when they look at the health problems facing this country.

But the Division of Research Resources (DRR) has been very much involved with the improvement of animal facilities in this country, assisting institutions to meet the AAALAC-accreditation standards. DRR has also been very much involved in the training of people to man and direct these programs and also in supporting research which is targeted at the laboratory animal itself, to improve the quality of research and decrease the numbers of animals that succumb to disease or morbidity.

The AAALAC—and NIH programs have been enormously important in addressing the concerns of this committee. I hope you will recognize their role. As we go through these very difficult economic times, it is important to recognize that there are significant pentup needs in the research capacity of this country to improve animal facilities, to upgrade equipment, and certainly in the training area there are a paucity of training funds to prepare people to assume the type of roles you are speaking of within our institutions.

Mr. **Walgren**. Are there other suggestions for how to improve the peer review?

Mr. **Knobil**. Just wanted to comment that when a new member of a study section, a peer review panel of the National Institutes of Health, for example, comes on board, he does not freewheel, he follows certain guidelines which are handed to him, as to all the other members of the panel, which come from the Division of Research Grants or other offices of the NIH. Members of these panels recognize their responsibility and adhere to these guidelines. I haven't seen them recently, but if this aspect of the research program were emphasized as a particular point of interest for each reviewer I think it would have a significant impact in upgrading the peer review process in these dimensions. That simple step alone I think would help.

Dr. **Levey**. I would like to just add, I think it is difficult for all of us on the panel to comment specifically on the Silver Spring incident because I think a lot of us have not seen the facts and have read some newspaper articles and listened to some commentary on television. I would think that if there is a blue ribbon investigation of this kind of an incident, it should be able to identify whether it was a breakdown of the inspection system, of the USDA, or whatever.

The peer review system as it is set up at the National Institutes of Health really works extraordinarily well, and I think most of us have served on study sections. It is quite rigorous; I think that the peer review has been the hallmark of the NIH, and it has done extremely well in terms of its functioning, and I do not think there is too much of a deficiency regarding peer review. But it is hard for us to comment specifically on this one incident because we don't know where the breakdown was.

Mr. **Walgren**. Well, part of the breakdown was in the failure to raise warning flags and bring the situation to the attention of others outside who may be trying to cover a very wide area in their responsibility. I would appreciate any thoughts you may have on how you might create a system which would have greater potential to raise warning flags. Then more careful evaluation by others who would be certainly consistent with the scientific community's best interest, could assure that there are not things going on that we do not know about.

I think that is one of the basic problems. Now the public needs assurance, in my view. The closed doors do not provide assurance, and we are very doubtful that the proper warning flag would be raised if something was going wrong behind those closed doors.

Well, we certainly appreciate the testimony, and we may follow up with some written interrogatories. Particularly I would like to learn more about the organization AAALAC that you described, Dr. Melby, and its role.

[The requested material on the American Association for Accreditation of Laboratory Animal Care [AAALAC] follows:]

THE AMERICAN ASSOCIATION FOR ACCREDITATION OF LABORATORY ANIMAL CARE

The American Association for Accreditation of Laboratory Animal Care (AAALAC) accredits animal care and use programs. The Association is the only accrediting body of this kind in this country, and the program has been widely acclaimed for its accomplishments in the care and use of animals in biomedical research.

The governing body of AAALAC, a Board of Trustees, is comprised of representatives of 23 scientific societies, which are among the most prestigious scientific organizations in the United States.

The criteria by which animal care and use programs of accredited institutions are judged are principally those found in the "Guide for the Care and Use of Laboratory Animals," published by the Institute of Laboratory Animal Resources of the National Research Council, NAS. The animal care program of each and every institution which applies for AAALAC accreditation is subject to comprehensive and thorough evaluation by two or more experts in the field. The applicant institution must provide substantial data on programs for animal care and use, and the evaluators (site visitors) scrutinize all information presented to them and do a thorough inspection of the animal facilities and associated laboratories. The review encompasses all aspects of animal care and use, including laboratory animal management (housing, sanitation, husbandry), laboratory animal quality and health (veterinary medical care, including prevention, diagnosis, treatment and control of diseases, anesthesia, analgesia, surgery and post-surgical care, among others), institutional policies governing the care and use of animals (monitoring animal care and use, veterinary care, personnel qualifications, occupational health, and use of hazardous agents), physical plant (temperature, humidity, and ventilation, housing, feed and feeding, etc.). A detailed and comprehensive report is written by the site visitors and the entire site visit report is reviewed by the AAALAC Council in Accreditation, consisting of 16 experts, all of whom have extensive experience in the care and use of laboratory animals, and who have conducted numerous visits to research laboratories. Accreditation is recommended by the Council on Accreditation based upon the institution's compliance with all appropriate standards, guidelines and federal laws. All accredited institutions are evaluated on site at intervals not exceeding three years, and at shorter intervals at the discretion of AAALAC. Each accredited institution is required to file an annual report with AAALAC, documenting any changes in the animal care and use program.

Currently, there are approximately 415 accredited institutions which are listed in AAALAC's "Animal Activities Report". It is noteworthy that the National Institutes of Health (NIH) of the Department of Health and Human Services is the principal governmental organization funding biomedical research in this country. The NIH requires all institutions awarded NIH funds for biomedical research to be in full compliance with provisions in the "Guide for the Care and Use of Laboratory Animals" (DHHS Publication No. NIH-72-83, Rev. 1978), and accepts accreditation as prima facie evidence of an institution's full compliance with these comprehensive and definitive standards.

The AAALAC accreditation program is widely accepted as the most definitive means by which an institution can demonstrate to have an exemplary program for the care and use of animals in biomedical research.

Dr. **Jordan**. I wonder in terms of peer review if I could make just a comment about the flip side of that, namely, that there is a historical tendency to assume that if you can't do anything else right, you can work in the animal care unit. And that is probably one of the real weaknesses in the system.

The misconception is that, if you have calluses on the back of your hands from dragging them on the ground, you still can work in the animal care unit. That is just not so. I hope my colleagues would agree that with a little bit of money, we could encourage upgrading of the qualifications of animal care workers. We could raise that to a profession. I think that is one of the real cornerstones. You will probably make more headway by making the people that are working in those animal care units enthusiastic about the importance of their job.

Mr. **Walgren**. Thank you very much. We appreciate your participation, and we will be in touch with you.

I would like to ask Mr. Brown, if he would, to introduce the next panel.

Mr. **Brown** [presiding]. We are going to try to finish up this morning with the remaining witnesses that were invited to be here, Dr. Nathaniel Pallone; if I did not pronounce that correctly I hope you will correct me, university professor and acting vice president of Rutgers, who will be accompanied by Dr. Franklin M. Loew. I would also like to ask Dr. Perrie Adams, chairman of the Department of Psychiatry and Behavioral Sciences, University of Texas, to also come forward and be a part of this panel. Who else do we have?

DR. NATHANIEL PALLONE, UNIVERSITY PROFESSOR AND ACTING VICE PRESIDENT, RUTGERS UNIVERSITY, ACCOMPANIED BY DR. ARTHUR BUTTERFIELD, CHIEF VETERINARIAN, GEORGETOWN UNIVERSITY AND DR. FRANKLIN M. LOEW, DIRECTOR, DIVISION OF COMPARATIVE MEDICINE, JOHNS HOPKINS UNIVERSITY REPRESENTING ASSOCIATION OF AMERICAN UNIVERSITIES, NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES, AND THE AMERICAN COUNCIL ON EDUCATION, AND DR. PERRIE ADAMS, CHAIRMAN, DEPARTMENT OF PSYCHIATRY AND BEHAVIORAL SCIENCES, UNIVERSITY OF TEXAS MEDICAL BRANCH, REPRESENTING THE AMERICAN PSYCHOLOGICAL ASSOCIATION

STATEMENT OF DR. NATHANIEL PALLONE

Mr. PALLONE. Mr. Chairman, I am Dr. Pallone. I am accompanied today by Dr. Arthur Butterfield, Chief Veterinarian, Georgetown University, and Dr. Franklin Loew of John Hopkins.

Mr. BROWN. Certainly we welcome these other gentlemen, and I apologize for not having the correct list of characters.

Would you like to start, Dr. Pallone. I know that our distinguished ranking Democratic member, Congressman Roe, wanted to say some nice words about you, but we will put those in the record later and you may proceed with your statement at the present time.

Mr. PALLONE. Thank you very much, Mr. Chairman.

I want to thank the committee for agreeing to hear from the university community on the issues before you.

I come before you not as a researcher who specializes in animal research but rather as a university administrator whose responsibility it has been for some years to insure that the policies of our university with respect to research procedures are followed. And I would ask that the committee consider the distinction between basic scientific inquiry as it is carried on in the Nation's universities and routine laboratory testing or evaluation, particularly of products, as it is carried on independent or commercial laboratories, and the impact that distinction has on the legislation before you.

I appear not only on behalf of Rutgers University but also on behalf of the American Council on Education, an umbrella organization which represents some 1,600 institutions and associations of higher education, on behalf of the National Association of State Universities and Land-Grant Colleges and on behalf of the Association of American Universities, an organization of 48 of the Nation's leading research institutions.

There are really three principal issues from the university perspective with respect to the regulation of research on live animals.

First, the current status of the animal population at universities and how animals are cared for under current regulations and university procedures.

Second, the type of research in which academic scientists in universities use live animals, and the rationale for the use of animals in lieu of alternative methods, and, Third, the financial condition of the university research base relative to live animal research.

Let me simply recapitulate some of the points made at greater length in the written statement.

At universities we use animals in basic scientific inquiry, essentially in order to improve human health and well-being, as well as, and I don't think in the comments I have heard today that this point has been made, in basic scientific inquiry devoted to the improvement of the health of animals themselves.

The research conducted at universities generally involves measures of complex responses which require an intact living organism of complex nature in order to be conducted effectively. It is a matter of record that, since 1901, 41 Nobel prizes in physiology and medicine have been awarded on the basis of studies which involved the use of experimental animals, including the prizes announced only this week.

It would have been impossible to develop coronary bypass operations, to protect the population from carcinogens, to have lowered our infant mortality rate, without the use of animal models. Nor could the intricacies of nutrient interactions have been understood without of animal experimentation.

We couldn't have protected the millions of pet dogs in the United States against parvo virus or even have created an effective and harmless worm medication for our pets without the use of experimental animals.

University research on agricultural animals has led to improved human nutrition through increased food production of poultry, pork, beef, and fish. Experimental animals are needed to keep us moving at the very frontiers of basic scientific inquiry, which is the underpinning of essentially all medical, agricultural, and industrial development.

I would like to be able to tell you that abuses in the use of animals in university research never occur. I can't say that, but I can say that they are rare in terms of the example we heard about earlier today. It is the case at Rutgers and at all other institutions I know about that there already exist both mechanisms and pathways for the reporting of practices which violate university policy or which violate the law, and there are sanctions attached.

In addition to controls within the university, there are controls within the scientific community at large, expressed in part through the prepublication review system of scientific journals; and it should be emphasized that alternative methods not involving experimental animals are already in use in the academic scientific community wherever feasible. Indeed, our data suggests that there has been a 40-percent decline within the past decade in the use of live animals in university research.

But the imposition of alternative methods, without consideration of questions of scientific feasibility, by legislative fiat might well impede scientific research and might well actually lengthen the period of human suffering needlessly with respect to many of the diseases currently under investigation.

I would also like to mention the current status of the Nation's university research base relative to the use of live animals. I suspect that the members of the committee are already aware of many aspects of the status of the research instrumentation and facilities in our universities.

A recent study by the Association of American Universities has found that we operate with research equipment in the universities that has a median age twice that used in industry. In terms of research facilities we now conduct research in buildings which were built decades ago and which are now greatly in need of renovation and modernization.

The Nation's universities are simply not in a condition to endure additional costs out of current funds without doing harm to the base of financial support for research.

Some of the aspects of the proposed legislation would therefore put the universities in double jeopardy, by curtailing our research support base, by reducing the availability of Federal funds at a time of shrinking resources, and simultaneously forcing us to stop much of our most basic and most valuable research.

That concludes, Mr. Chairman, the points that I wish to emphasize from my written statement, and if you have questions of either myself or my colleagues, we would be happy to answer them.

[The prepared statement of Dr. Pallone follows:]

STATEMENT OF NATHANIEL PALLONE, UNIVERSITY PROFESSOR, ACTING EXECUTIVE VICE-PRESIDENT AND CHIEF ACADEMIC OFFICER, RUTGERS, STATE UNIVERSITY OF NEW JERSEY

Mr. Chairman, I am Nathaniel Pallone, University Professor and Acting Executive Vice-President and Chief Academic Officer of Rutgers, the State University of New Jersey, and I am here to provide a university prespective on the status of live animal research. My testimony has been endorsed by the American Council on Education, the umbrella higher education organization which represents some 1600 institutions and associations, the National Association of State Universities and Land-Grant Colleges, which represents the 141 public universities and colleges, and the Association of American Universities, which is an organization of 48 of this Nation's leading research universities.

Any statement on the status of university live animal research must consider at least three dimensions: (1) the current status of our animal population and how it is cared for under university and federal regulations, (2) the types of research in which we use live animals and the rationale for the use of animals instead of alternative methods, and (3) the financial condition of the university research base relevant to live animal research. I would like to review these three items with you briefly.

First, in terms of the animal research population and its care, I would like to refer to Rutgers as an example. We normally have an animal population of approximately 20,000, which are used in a wide variety of agricultural, biological, and medically oriented experiments. Of the 20,000 animals, 29 are monkeys, 40 are cats, and 46 are dogs; the remainder include such animals as mice, rats, guinea pigs, rabbits, as well as a large number of farm animals used for instruction and for important agricultural and nutritional research.

This animal population at Rutgers is cared for in compliance with the Animal Welfare Act of 1966 [PL 89-544] and its 1970 [PL 91-579] and 1976 [PL94-279] Amendments. In a typically externally funded project, the researcher must develop an application, which contains a written protocol for the experiment on the animal describing all methods, techniques, anesthesia, and drugs to be used during the testing. The application is subject to approval by the University vetinarian, the Department Chairman, the Dean of the College, and the Director of the Office of Research and Sponsored Programs at the University. The overall policy in the use of these animals is under jurisdiction of my Office and the day to day operations, which ensure policy compliance, are handled by the Rutgers University Office of Animal Care, which has an annual budget in excess of $125,000.

Second, I would underscore the reasons for the use of this animal population. We use animals in research in order to improve human health and well being, as well as the health of animals themselves. We have to use animals, because in most cases, the only experimentally valid alternative to the use of animals would be the use of humans. In addition, the research conducted measures complex responses, which requires an intact living organism with an equally complex nature. It is a matter of record that since 1901, 41 Nobel Prizes in physiology and medicine, including the recently announce 1981 prize, have been awarded on the basis of studies which involved the use of experimental animals. It would have been impossible to develop the highly successful coronary bypass operation, to protect the population from carcinogens, or to have lowered our perinatal and infant mortality without the use of animal models, nor could the intricacies of nutrient interactions have been understood without the use of animal experimentation. We also could not have protected the millions of pet dogs in the United States against Parvo virus, or even have created an effective and harmless worm medication for our pets without the use of experimental animals. Last, but not least, experimental animals are needed to keep us moving at the frontiers of basic research, which is the underpinning of essentially all medical, agricultural and industrial development.

At Rutgers we use research animals in a wide variety of areas. These include studies of kidney function, muscles in connection with the investigation of the causes of muscular dystrophy, coronary blood flow, the cause and cure of osteoporosis, the role of zinc in metabolism, cirrhosis of the liver, the metabolic consequences of alcoholism, aggression and its control, morphine addiction and its reproductive consequences, protozoan infections, the cellular basis of the immune response system, the hormonal basis of poultry and beef growth, and the protection of humans and animals from industrial toxicants. While this list may appear to be a long one, I certainly do not pretend that it is complete, since animal experimentation forms the basis of our medically, nutritionally or toxicologically oriented research.

Universities do not abuse animals. There are, of course, exceptions, but such exceptions can be found in any field of human endeavor. In addition to intra-university controls, there are those of the scientific community at large, epressed, in part, through the prepublication review system of scientific journals. It may be emphasized that alternative methods not involving experimental animals are already used where feasible. However, the imposition of such methods, without consideration of feasibility, by legislative fiat would impede scientific research and, in our opinion, lead to needless human suffering.

Finally, I think we need to underscore the current status of America's university research base relative to the use of live animals. I suspect that every member of this Committee is aware to a certain extent of the status of America's university research instrumentation and facilities. A recent study by the Association of American Universities has found that we operate with research equipment that has a median age twice of that used in industry. In terms of research facilities, we now conduct research in buildings which were built decades ago with a large contribution of federal dollars but which are now greatly in need of renovation and modernization. At Rutgers we require at least $20 million to cover the costs of deferred maintenance and minor improvements in our physical plant. Our budget from the State is the same this year as last despite inflation. We are simply in no position to absorb additional costs out of our current funds without doing further harm to the University research base. Some of the proposed legislation would therefore put us in double jeopardy: it would curtail our research support base by reducing the availability of federal funds at a time of shrinking resources and it would simultaneously force us to stop much of our most valuable research.

It is important to note that the animal research facilities within our research universities are subject to local, state, and federal standards. Despite the grave economic pressures on their research activities, most universities strive to comply with the standards of the American Association for Accreditation of Laboratory Animal Care, recognized by the National Institutes of Health as the standard setting association in their grant approval procedures. While animal research laboratories within the research universities are up to standards, there has been no recent assessment of current unmet needs. The Association of American Universities, in cooperation with the American Council on Education and the National Association of State Universities and Land-Grant Colleges has proposed a study of research equipment and facilities needs, including animal facilities which is yet unfunded.

It is clear that the results of some of the legislation under consideration today could be devastating to the research productivity of American academic scientests. I recommend a more appropriate approach for this Committee in the area of university live animal research. A first step should be to fund a survey of animal care facilities and needs at our research universities, provide a cost estimate of recommended improvements, and identify an appropriate legislative mechanism to fund these costs.

Mr. **Brown**. Do the others have written statements, also?

Mr. **Pallone**. No, sir.

Mr. **Brown**. Thank you. Let's go ahead then with Dr. Adams.

STATEMENT OF DR. PERRIE ADAMS

Dr. **Adams**. I am testifying today as Chair of the American Psychological Association's Committee on Animal Research and Experimentation.

The American Psychological Association, or APA, is the Nation's major professional and scientific organization representing psychology. Together with its sister organization, the Association for the Advancement of Psychology, APA represents over 65,000 members and affiliates.

The Committee on Animal Research and Experimentation is one of the APA's oldest committees. It was established in 1925 and from its inception has been concerned with the welfare of animal research subjects.

Clearly, our concern predates much of the current controversy in this area, and as our purposefully selected acronym—CARE—illustrates, we are sensitive to the issues of humaneness that are involved.

The committee's stated responsibility, delegated to it by APA, is to review the ethics of animal experimentation, and to disseminate guidelines for protecting the welfare of animals used in research, and to consult on the implementation of those guidelines.

The guidelines referred to here have been continuously revised and upgraded by CARE over the past 30 years. Further, they are part of the enforceable standards of conduct for APA members, known as the ethical principles of Psychologists.

The principles governing care and use of animals in research require that the investigator insures the welfare of animals and treats them humanely. They go on to state that a psychologist trained in research methods and experienced in the care of laboratory animals is responsible for insuring appropriate consideration of their comfort, health, and humane treatment.

Finally, it is mandated that psychologists will make every effort to minimize discomfort, illness, and pain of animals. A procedure subjecting animals to pain, stress, or privation is used only when an alternative procedure is unavailable and the goal is justified by its prospective scientific, educational, or applied value.

This subcommittee is to be commended for conducting these hearings on the use of animals in research. The issues raised in this debate are emotional as well as scientific in nature, making consensus a difficult and elusive goal.

APA has been addressing these issues for some time, and as the excerpts from our ethical principles illustrate, we fully support many of the goals of the various legislative proposals that have been introduced on this subject.

Yet, we feel we must point out that the assumptions on which we operate as scientists appear to be very different from the assumptions made by animal welfare advocates about the nature of animal research. We believe that the use of live animals in research and experimentation is essential in efforts to save lives and improve human welfare. Animal research is not designed to make animals suffer. It is designed to alleviate human suffering. Research goals do not focus on the scientific use of animals as an end point. Rather, research is focused on understanding and combating medical, behavioral, and social conditions that are problems for the human race. To discontinue or severely dilute these efforts would deny the extraordinary history of breakthroughs that have resulted from research involving animals as experimental subjects.

Before citing specific examples of such accomplishments, let me again stress that we are in accord with the basic purposes of the legislation before this committee. If a research issue can be addressed effectively without the use of animal subjects, then we are mandated by our Ethical Principles to pursue these alternatives. But the question that needs to be answered is whether the development of alternative methods of research and testing is too great an unknown on which to hinge policies as important as those under discussion during these hearings.

Current research methods are not immune to change, but there must be a sound basis for rejecting them. The desire to exempt animals as research subjects compels many to believe that there are alternative research methods, but we cannot automatically assume that alternatives exist. That alternatives are not being used en masse does not signal a lack of awareness or sensitivity on the part of the research community, nor does it indicate a propensity to inflict harm on animal subjects. It may well accurately reflect the necessarily slow but deliberate search process for alternatives.

I raised the unknowns surrounding the development of alternatives. One of the most crucial of them is how much ongoing research we would lose in that pursuit. We cannot afford to put research on hold while alternatives are being developed. Yet, this is what has been proposed in the bills under consideration. For example, in H.R. 556, the so-called Research Modernization Act, it is proposed that the search for alternative methods of research be supported by transferring 30 to 50 percent of the total appropriations for Federal research and testing programs involving live animals. Further, H.R. 556 would require agencies housing or sponsoring such programs to support training in the use of alternatives. The combined effects of these actions would be to divert funds from widely accepted and successful methods of research and direct them toward undiscovered and unproven alternative methods. As members of this subcommittee know too well, this is a time when economic resources available for research grants and training are already in grave danger because of diminishing funds to the nondefense-related Federal budget.

Not only does this affect the standing of the United States as a world leader in science, but more importantly, it jeopardizes the momentum in research toward solving or developing ways of coping with the myriad medical and social ills that affect humankind. Assessment of the damage and opportunity costs involved could never be made, but it is inconceivable that 30 to 50 percent of the current research efforts involving the use of live animals could be adequately or quickly replaced by models and other methods of simulation that are not now available. The damage would be compounded by abandoning ongoing research in favor of the search for alternatives. Can we really afford to give up for the next generation the sorts of accomplishments that have come out of animal research in generations past?

Let me provide some examples of the accomplishments that have come from animal research in psychology. These findings might never have emerged under unduly restrictive laboratory animal regulations.

The majority of what we know about how people learn began years ago in psychological research laboratories based on studies using animal subjects. Such everyday concepts as reinforcement and reward emerged from carefully controlled animal studies that would not have been appropriate for human subjects, but that clearly have helped the human condition.

For example, biofeedback allows for the conscious control of what are usually automatic bodily functions, such as blood flow, heartbeat, and muscle position. Today the technique is being used to effectively treat wide-ranging medical problems—scoliosis, a disabling and disfiguring curvature of the spine, heart problems, insomnia, low back pain, and a number of others.

Behavior modification and behavior therapy are learning-theory approaches to change how an individual acts in certain situations. The techniques would not have come to being without early and continuing psychological research on what influences animal behavior.

Today, both have been documented literally hundreds and perhaps thousands of times in improving the lives of hospitalized mental health patients and in developing effective therapies for psychological disorders. The techniques also are gaining notoriety because of their successful application to problems of obesity, alcoholism, and drug addiction.

Research on animal learning has played a key role in America's space program. The recent successful voyage of the space ship Columbia has allowed us all to feel a proud sense of mastery over space, but it was only 20 years ago that we were looking at space with feelings of uncertainty and peril.

Among our unanswered questions back then were whether and how well astronauts would perform in the space environment. We answered those questions in part by sending two chimpanzees on a trial mission.

The chimps, Ham and Enos, were carefully trained by psychologists who specialized in animal learning. The chimps were sent into orbit, performed their complex tasks perfectly, and were safely returned to Earth.

Was the training they received from psychologists and the costs of the trial flights worth it? Perhaps Senators Glenn and Schmitt could provide a better answer than I.

Conditioned taste aversion is a learning technique in which eating a certain food is followed by a drug which produces an unpleasant reaction. This pairing of food and illness often results in the refusal to eat even a small amount of that food again.

The effect was developed in the animal laboratory by psychologists interested in the psychophysiological mechanisms of taste in the rat, but its applications have gone far beyond the laboratory.

Taste aversion has given new insight into the problems and solutions to problems of cancer patients undergoing radiation therapy. A severe problem in radiation therapy has been that patients simply would not eat sufficiently following treatments, compounding the debilitating nature of the cancer itself.

Now it is a common strategy to deliberately condition a cancer patient to avoid a certain food following radiation treatment so that the patient will eat other foods and maintain proper nutrition.

The psychological research laboratory in which animal subjects are used has also given rise to important findings for humans that are not based solely on learning principles, but that are based in other less well-known areas of psychology.

The Royal Swedish Academy of Sciences has this past week awarded its Nobel Prize to distinguished APA member Dr. Robert Sperry for "unlocking the secret of the brain." Sperry, working with animals, determined that the hemispheres of the brain are separate and communicate to each other in special ways only through a connecting band of fibers. The cutting of these fibers resulted in what might be characterized as two distinct brains, both working independently within one animal.

This research, again with the help of Dr. Sperry, has directly given rise to the understanding and treatment of a variety of severe neurological problems in humans, among them epilepsy, stroke, language disorders, and brain damage. It has also contributed immeasurably to our understanding of how normal brain development occurs.

This list could go on, but other examples would only echo the theme of those listed here. Controlled psychological studies using animal subjects were required before a human problem could be adequately addressed and solved. We maintain that a carefully and humanely conducted series of animal studies is not too high a cost to pay for improving the human condition.

In conducting these hearings, the subcommittee is providing a much-needed forum for the debate on the experimental use of live animals. However, the subcommittee and Congress as a whole is being asked to set science policy based on one set of assumptions and views that virtually ignore or reject a number of relevant scientific and social questions that must necessarily be brought to bear.

Therefore, we respectfully recommend that legislative actions of the kind that have been proposed be postponed in favor of a more balanced and deliberative examination of their effects on research and on society as a whole.

Concern for the humane treatment of animals is the common denominator for all the parties involved. Let us look for constructive ways to build on this common ground so that the unintended consequences of hasty actions can be avoided.

Thank you for your attention. I would be pleased to respond to your questions.

[The prepared statement of Dr. Adams follows:]

STATEMENT OF PERRIE M. ADAMS, PH. D., ON BEHALF OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION AND THE ASSOCIATION FOR THE ADVANCEMENT OF PSYCHOLOGY

Mr. Chairman, members of the Committee,

My name is Dr. Perrie Adams. I am a professor of psychology at the University of Texas Medical Branch. I am testifying today as chair of the American Psychological Association's Committee on Animal Research and Experimentation.

The American Psychological Association, or APA, is the nation's major professional and scientific organization representing psychology. Together with its sister organization, the Association for the Advancement of Psychology, APA represents over 65,000 members and affiliates. The Committee on Animal Research and Experimentation is one of APA's oldest committees. It was established in 1925 and from its inception has been concerned with the welfare of animal research subjects. Clearly, our concern predates much of the current controversy in this area, and as our purposefully selected acronym -- CARE -- illustrates, we are sensitive to the issues of humaneness that are involved.

The Committee's stated responsibility, delegated to it by APA, is to "review the ethics of animal experimentation, and to disseminate guidelines for protecting the welfare of animals used in research, and to consult on the implementation of those guidelines." The guidelines referred to here have been continuously revised and upgraded by CARE over the past 30 years. Further, they are part of the enforceable standards of conduct for APA members, known as the Ethical Principles of Psychologists.

The Principles governing care and use of animals in research require that "the investigator insures the welfare of animals and treats them humanely." They go on to state that "a psychologist trained in research methods and experienced in the care of laboratory animals is responsible for insuring appropriate consideration of their comfort, health, and humane treatment." Finally, it is mandated that "psychologists will make every effort to minimize discomfort, illness, and pain of animals. A procedure subjecting animals to pain, stress, or privation is used only when an alternative procedure is unavailable and the goal is justified by its prospective scientific, educational, or applied value."

This subcommittee is to be commended for conducting these hearings on the use of animals in research. The issues raised in this debate are emotional as well as scientific in nature, making consensus a difficult and elusive goal. APA has been addressing these issues for some time, and as the excerpts from our Ethical Principles illustrate, we fully support many of the goals of the various legislative proposals that have been introduced on this subject.

Yet, we feel we must point out that the assumptions on which we operate as scientists appear to be very different from the assumptions made by animal welfare advocates about the nature of animal research. We believe that the use of live animals in research and experimentation is essential in efforts to save lives and improve human welfare. Animal research is not designed to make animals suffer. It is designed to alleviate human suffering. Research goals do not focus on the scientific use of animals as an end point. Rather, research is focused on understanding and combatting medical, behavioral, and social conditions that are problems for the human race. To discontinue or severely dilute these efforts would deny the extraordinary history of breakthroughs that have resulted from research involving animals as experimental subjects.

Before citing specific examples of such accomplishments, let me again stress that we are in accord with the basic purposes of the legislation before this committee. If a research issue can be addressed effectively without the use of animal subjects, then we are mandated by our Ethical

Principles to pursue these alternatives. But the question that needs to be answered is whether the development of alternative methods of research and testing is too great an unknown on which to hinge policies as important as those under discussion during these hearings. Current research methods are not immune to change, but there must be a sound basis for rejecting them. The desire to exempt animals as research subjects compels many to believe that there are alternative research methods, but we cannot automatically assume that alternatives exist. That alternatives are not being used en masse does not signal a lack of awareness or sensitivity on the part of the research community, nor does it indicate a propensity to inflict harm on animal subjects. It may well accurately reflect the necessarily slow but deliberate search process for alternatives.

I raised the "unknowns" surrounding the development of alternatives. One of the most crucial of them is how much ongoing research we would lose in that pursuit. We cannot afford to put research on hold while alternatives are being developed. Yet, this is what has been proposed in the bills under consideration. For example, in H.R. 556, the so-called Research Modernization Act, it is proposed that the search for alternative methods of research be supported by transferring 30-50 percent of the total appropriations for federal research and testing programs involving live animals. Further, H.R. 556 would require agencies housing or sponsoring such programs to support training in the use of alternatives. The combined effects of these actions would be to divert funds from widely accepted and successful methods of research and direct them toward undiscovered and unproven alternative methods. As members of this subcommittee know too well, this is a time when economic resources available for research grants and training are already in grave danger because of diminishing funds to the non-defense related federal budget. Not only does this affect the standing of the United States as a world leader in science, but more importantly, it jeopardizes the momentum in research toward solving or developing ways of coping with the myriad medical and social ills that affect humankind. Assessment of the damage and opportunity costs involved could never be made, but it is inconceivable that 30-50 percent of current research efforts involving the use of live animals could be adequately or quickly replaced by models and other methods of simulation that are not now available. The damage would be compounded by abandoning ongoing research in favor of the search for alternatives. Can we really afford to give up for the next generation the sorts of accomplishments that have come out of animal research in generations past?

Let me provide some examples of the accomplishments that have come from animal research in psychology. These findings might never have emerged under unduly restrictive laboratory animal regulations.

The majority of what we know about how people learn began years ago in psychological research laboratories based on studies using animal subjects. Such everyday concepts as reinforcement and reward emerged from carefully controlled animal studies that would not have been appropriate for human subjects, but that clearly have helped the human condition. For example:

- Biofeedback allows for the conscious control of what are usually automatic bodily functions, such as blood flow, heart beat, and muscle position. Today the technique is being used to effectively treat wideranging medical problems:

  Scoliosis is a disabling and disfiguring curvature of the spine. Biofeedback has been shown in ground breaking research to actually reverse the process;

  Applied to heart problems, biofeedback is used to teach cardiac patients to control their blood pressure, and, thus, significantly lessen the likelihood of future attack;

Applied to migraine headaches, insomnia, and low back pain, biofeedback is considered by many to be the treatment of choice. Thus, biofeedback is dealing with problems that not only plague millions of Americans, but cost American industry billions of dollars each year in employee absence and poor worker efficiency.

The use of all these medical treatments based on biofeedback began with psychologists interested in the conditioning of the autonomic nervous system of the rat.

- Programmed Instruction is the application of learning principles to standard educational tasks. Programmed instruction appears to be the future hope in effectively and efficiently training recruits in the armed services with increased savings in training costs. It also is being used in schools, colleges, and other institutions to teach reading and vocational training, and even selfhelp skills to the mentally retarded. The cost of programmed instruction compared to the traditional classroom setting is miniscule and the potential benefits, both social and economic, are enormous. But the technique would not have come about without basic research on the learning of sequential tasks by animals.

- Behavior Modification and Behavior Therapy are learning-theory approaches to changing how an individual acts in certain situations. The techniques would not have come to being without early and continuing psychological research on what influences animal behavior. Today, both have been documented literally hundreds and perhaps thousands of times in improving the lives of hospitalized mental health patients and in developing effective therapies for psychological disorders. The techniques also are gaining notoriety because of their successful application to problems of obesity, alcoholism, and drug addition.

  What has been less publicized is the effect of such behavioral programs in the industrial sector. For example, Emery Air Freight Company recently reported that a behavior modification program with its employees has increased its use of productive capacity from 45 to 90 percent, with savings of more than $2 million over three years. (Organizational Dynamics, 1973, 2, Winter, 41-50.)

  A behavioral program also has been used to teach job finding skills to the unemployed of our country. The cost of placement in this Job Finding Club, as the program has been called, was an incredibly low $167 per person and the participants in the program were twice as likely to secure and retain employment as those using other employment programs (Behavior Research and Therapy, 1975, 13, 17-27). The Job-Finding Club concept has now raised considerable interest in the Department of Labor for use in placing clients who otherwise would be eligible for welfare (U.S. Department of Labor, Report No. DLMA-51-17-76-04, 1978).

Not only does this Club concept stem directly from principles of learning first investigated through animal research, but the job club's developer is one of the foremost animal learning psycholigists in this country.

o Research on animal learning has played a key role in America's space program. The recent successful voyage of the space ship Columbia has allowed us all to feel a proud sense of mastery over space, but it was only 20 years.ago that we were looking at space with feelings of uncertainty and peril. Among our unanswered questions back then were whether and how well astronauts would perform in the space environment. We answered those questions in part by sending two chimpanzees on a trial mission. The chimps, Ham and Enos, were carefully trained by psychologists who specialized in animal learning. The chimps were sent into orbit, performed their complex tasks perfectly, and were safely returned to earth. Was the training they received from psychologists, and the costs of the trial flights worth it? Perhaps Senators Glenn and Schmidt could provide a better answer than I.

o Conditioned taste aversion is a learning technique in which eating a certain food is followed by a drug which produces an unpleasant reaction. This pairing of food and illness often results in the refusal to eat even a small amount of that food again. The effect was developed in the animal laboratory by psychologists interested in the psychophysiological mechanisms of taste in the rat, but its applications have gone far beyond the laboratory. Taste aversion has given new insight into the problems and solutions to problems of cancer patients undergoing radiation therapy. A severe problem in radiation therapy had been that patients simply would not eat sufficiently following treatments, compounding the debilitaling nature of the cancer, itself. Now, it is a common strategy to deliberately condition a cancer patient to avoid a certain food following radiation treatment so that the patient will eat other foods and maintain proper nutrition.

A similar approach is used in treating anorexia, a condition in which young people starve themselves, sometimes to death. Again, a deliberate learned aversion is produced to one food that results in the eating of other foods.

The same process has been used successfully in the field of agriculture. In California, coyotes and wolves are fed mutton laced with a drug to produce an unpleasant reaction. The result is that predators, without being harmed, are conditioned in one step to cease attacks on sheep, even though sheep have been preyed upon for generations. Estimates of savings in lost stock run in the millions of dollars. Similarly, in North Dakota there is now a program underway in which black birds are being conditioned by taste aversion to stay away from crops. The potential cost-savings of this project are enormous.

- In other learning theory applications of animal research, ongoing attempts to teach language skills to chimpanzees have led to new experimental techniques for teaching these skills to profoundly retarded, nonverbal children. In fact, a few months ago, a new research center opened in Atlanta where investigators are using chimps to develop language training methods that can be applied to such children.

- Desensitization is one of the most effective and straightforward psychological approaches for removing phobias and other debilitating fears, such as fears of flying, of certain animals, or of crowded places. As a result, this direct byproduct of basic animal research on the principles of learning allows otherwise apprehensive people to lead comfortable and productive lives.

- Behavioral research has shown that a phenomenon called learned helplessness occurs when an animal is placed in a stressful situation it cannot control. The finding is that the animal quickly gives up trying to escape. When later given the chance to escape, the animal will not overcome its helplessness unless it is forced to respond.

  The learned helplessness model has resulted in new insights into the causes and treatment of depression in humans. Ground-breaking research is now well underway to predict personality types most susceptible to depression, and to effectively deal with depression when it occurs, all based directly on the animal model.

The psychological research laboratory in which animal subjects are used has also given rise to important findings for humans that are not based solely on learning principles, but that are based in other less-well-known areas of psychology.

- The Karolinska Institute has this past week awarded its Nobel Prize to distinguished APA member Dr. Roger Sperry for "unlocking the secret of the brain." Sperry, working with animals, determined that the hemispheres of the brain are separate and communicate to each other in special ways only through a connecting band of fibers. The cutting of these fibers resulted in what might be characterized as two distinct brains both working independently within one animal. This research, again with the help of Dr. Sperry, has directly given rise to the understanding and treatment of a variety of severe neurological problems in humans, among them epilepsy, stroke, language disorders, and brain damage. It has also contributed immeasurably to our understanding of how normal brain development occurs.

- Behavioral teratology is the psychological study of drug exposure during pregnancy on the behavioral development of the offspring. Behavioral deficits uncovered in this area of study often are observed in the absence of any obvious physical abnormalities. In fact, the approach has been shown in animals to be much more sensitive than using physical abnormalities in predicting the harmful effects of drugs on a fetus. This finding has resulted in the routine use of behavioral teratology to screen new drugs for safety before being given to pregnant women. Further, much of what we know about the risks of alcohol, caffeine, and smoking during pregnancy and their implications for birth defects and mental retardation stem from this behavioral work.

- The behavioral effects of drugs and chemicals on animals have been studied for the past 25 years to better understand the way drugs work, and to predict their toxic effects at a particular dosage. This psychological approach to examining drug effects has been particularly useful in classifying new drugs. For example, the distinction between major and minor tranquilizers is based on the behavioral responses of animals to these drugs. Also, much of the new exciting work on the opiates that are naturally present in the human brain was stimulated by observing the behavioral effects of these substances in animals. This work will ultimately allow us to develop new pain-relieving and mood-altering agents that work without the danger of drug addiction.

- Disorders of remembering are by far the most common impairments of the elderly, of those who suffer from senile dementia (Alzheimers' disease), of stroke victims, and head injury victims. These memory problems were commonly believed to result from injuries to memory traces, that is, to the parts of the brain that are modified by learning and experience. However, psychological experiments with animals that have suffered brain injuries have shown that there are few, if any such injuries which destroy memory traces. The studies suggest that the great majority of memory failures are due to impairments of access to memory traces that are latent, but intact. The implications of these findings for memory loss victims are now being vigorously pursued and new hormonal therapies based on these psychological studies are being developed.

- Psychologists who study animals attacking prey observe a type of paralysis that many times occurs in the prey called tonic immobility. Researchers are now using this result to develop a model of rape-induced paralysis in humans. This is among the first serious theoretical insights into the social problem of rape. The model has important implications for rape prevention, treatment and counselling of rape victims, and even the adjudication of accused rapists.

- The behavioral discovery that many animals convey information among themselves on the basis of chemical signals has lead to developments which have profound ecological implications for humans and animals alike. For example, the discovery and later synthesis of specific chemicals which insects use as sex attractants allowed scientists to chemically bait traps containing insecticides to control harmful agricultural pests without having to saturate the environment with large amounts of toxic and potentially harmful materials.

This list could go on, but other examples would only echo the theme of those listed here: Controlled psychological studies using animal subjects were required before a human problem could be adequately addressed and solved. We maintain that a carefully and humanely conducted series of animal studies is not too high a cost to pay for improving the human condition.

In conducting these hearings, the subcommittee is providing a much-needed forum for the debate on the experimental use of live animals. However, the subcommittee and Congress as a whole is being asked to set science policy based on one set of assumptions and views that virtually ignore or reject a number of relevant scientific and social questions that must necessarily be brought to bear. Therefore, we respectfully recommend that legislative actions of the kind that have been proposed be postponed in favor of a more balanced and deliberative examination of their effects on research and on society as a whole. Concern for the humane treatment of animals is the common denominator for all the parties involved. Let us look for constructive ways to build on this common ground so that the unintended consequences of hasty actions can be avoided.

Thank you for your attention. I would be pleased to respond to your questions.

Mr. **Walgren**. Thank you, Dr. Adams.

Mr. Brown?

Mr. **Brown**. Gentlemen, you both made good statements but I don't detect here any sense of urgency about making any improvements in the current situation. I am not necessarily being critical of this. Dr. Adams, wasn't it a member of your organization that was the focus of so much of this publicity that we have heard here recently or am I mistaken about that?

Dr. **Adams**. You are correct. Dr. Taub is in fact a member of APA.

Mr. **Brown**. I am sure he is a well-intentioned and well-regarded professional but he is causing a considerable setback to the cause of research in your field here. Is there anything within the profession that would seek to correct that?

Dr. **Adams**. Yes, I believe there would be. I might give you just in general what the current status of Dr. Taub's situation is with respect to the American Psychological Association.

There is a committee on the ethical standards of psychologists within APA. That committee will begin investigating Dr. Taub's case in depth in approximately 2 weeks. I am sure that the American Psychological Association would be more than happy to make any documentation available to you ih terms of the outcome and actions that they might take.

Mr. **Brown**. I would think that the committee would want to have that followup information. I don't profess to know what the facts are in this case other than what I have seen. I certainly do not desire to adopt a punitive attitude but I would like to feel that the system is working, that if you have a system for reviewing these cases that it functions in the way it is supposed to and it can be either beneficial to the cause—it can rectify possible injustices to Dr. Taub if it works correctly.

Dr. ADAMS. That is correct.

Mr. BROWN. I would hope it would do that. On the other hand, if part of the problem is a need for some further enhancement of the motivation and the concern of members of the profession it can also act to serve in that capacity. So, I think if the chairman has no objection, I would like to ask that you keep us posted on the result of your own association and the investigation of the situation.

Dr. ADAMS. We will be happy to do that.

Mr. BROWN. Dr. Pallone, you come from an outstanding institution with an impeccable record and you don't want it interfered with in any way. Your suggestion for improving the situation is to provide more money for improvement of your facilities. Do you think that is an adequate response to the situation?

Dr. PALLONE. Perhaps, Mr. Brown, if you could indulge me and let me describe the peer review process at Rutgers, the levels of control over live animal research at Rutgers and at most major institutions.

The process involves a faculty member developing a research design in rather great detail, obtaining the approval of his or her department chairperson and dean, then the approval of our office of research and responsive programs, then of the university veterinarian and the animal care committee if the research involves animal subjects or of the human subjects committee if the research involves human subjects.

Members of the animal care committee and the university veterinarian are not in the least embarrassed to reject proposals. The veterinarian in particular is charged by my office to insure conformance not only with Federal legislation, with NIH guidelines, with the standards of the American Association for the Accreditation of Laboratory Animal Care and the regulations of the Department of Agriculture, not to mention State and local and county organizations.

So, I believe there are adequate controls provided in the Nation's universities in conformance with existing legislation, existing Federal guidelines and indeed in conformance with the spirit of much of the legislation which is proposed, which in my view does not adequately distinguish those kinds of institutions engaged in animal research which already have appropriate review procedures, and here I would include most universities and those which may not.

Further, there is nothing in existing practice under NIH guidelines which precludes spot inspection on the part of Federal authorities. There is nothing that requires it either; but nothing precludes it.

Our basic concern is a set-aside of a particular sum, 30 to 50 percent, at a time of a shrinking monetary base for the support of research without an adequate look at the impact of that on the deterioration of research facilities in the Nation's universities.

Mr. BROWN. This committee, as you have indicated, is well aware of the lack of support for those shrinking research facilities and we have labored diligently although somewhat unavailingly to rectify that situation.

We hope to continue to do so. But, you are, as you have indicated, as you well know, faced with a shrinking budget anyway. If you are faced with a level of funding which is what I think you said, you are slipping 10 to 15 percent in real dollars now and it is likely to get worse before it gets better. It is very easy to say it would be better for research to rectify that shrinkage than to add additional cost to change the system for live animal experimentation.

But, I would like to see some indication that there is a motivation to reduce live animal experimentation in part because it would save you money. You know it is expensive and if you can provide alternatives that are less expensive that would be a way to rectify your shrinking research budget. I know you don't want to be forced to do that. No outstanding university does but you are being forced to do some things that you don't want to right now because of the shrinking budget that faces you.

I would hope that you would use this as an opportunity, this general situation, to explore that fortuitous coincident of goals which might come about by reducing animal experimentation and saving money at the same time.

Dr. **Pallone.** If I could, let me refer to the observation that I made that, in fact, alternative methods are now being used wherever they are scientifically feasible. Our data indicate, indeed, over the past decade a decrease on the order of forty percent in the use of live animals in university research.

If I could, maybe Dr. Butterfield could comment further on that.

Mr. **Brown.** Yes. There has been some conflicting information on this and I am not quite 'sure I have it sorted out. Several people have testified about the 40-percent reduction. Others have testified to the large increase in experimental animals that are in commerce at the present time.

Perhaps you could reconcile those statements Dr. Butterfield.

Dr. **Butterfield.** I am sure I can speak directly to the situation in terms of the animal population. At Georgetown, for example, at the university, I am the director of the animal resource facility. I am a veterinarian with a Ph. D. in experimental surgery, so I am engaged in surgical research. It occurs to me that the animal population fluctuates as the research grants and the moneys available for research grants become available to the researchers. So, right now, we are experiencing a decline in our population because of indeed the tight economic restraints that are placed on research. I guess I have listened to most of the testimony this morning and if you don't mind, I will take this opportunity to speak on a couple of questions that have been asked previously by the chairman and by you, Mr. Brown.

Mr. **Brown.** This is the best opportunity you will get.

Dr. **Butterfield.** One of the questions this morning involved animal care, and again to reiterate what Dr. Melby had said, we are under the most extreme constraints in terms of the care of the animals because we are members of a voluntary committee. It is to my advantage jobwise—it is a must as far as I am concerned, as far as President Healy and the chancellors are concerned—we must maintain our accreditation because it makes it so much easier for our—easier is not the right word—but the point is, NIH can look at us with confidence and say, here are facilities that indeed provide the very best care, and the care for example that is embodied in this association involves the floors of the facility; that is, floors without cracks, walls without cracks, the appropriate airflow. Those are the kinds of things we are concerned with.

One of the other witnesses this morning said that if he blew the whistle, his job was at stake. I indeed have the authority from Father Healy to the chancellor to shut down—walk in and say, "This is it; it is all over; research is done," if I see abuse. I will tell you, as a practitioner of private Veterinary medicine for 13 years and as a researcher, I will tell you unequivocally I have not detected abuse of animals at Georgetown University, nor would I tolerate it. It would be nice to say, obviously, I am a veterinarian, I love animals. Unfortuntely that is not always the case but in my case, I can tell you sincerely I do indeed think animals have rights and that we, as humans, should be the stewards of those rights, so I would not tolerate that.

Mr. Brown. Let me say I welcome that statement very much. I am sure that you have a superior operation. I have a similar—what I consider superior—operation in my own district run by a local medical school. It may be the fact that there is a religious orientation to the institution which helps in this regard—I do not know—but the facilities seem to parallel what you are describing in your own institution. I visit them and what little I know about this field is based upon visits of this sort. I have no comments to make.

Dr. Butterfield. One of the other questions, if I may briefly, one of the comments to one of the questions—the Chair asked, what about lay people on these committees? I personally would not have an objection to that provided the individual that is the lay member of the animal welfare committee were well informed. I do not necessarily mean they would agree with my views, but someone who could detach themselves from an emotional issue and could look at the things objectively. That is the real problem as I see it. We are trying to legislate something that involves emotions, and it is very difficult to deal with those kinds of things.

Mr. Walgren. Thank you, Mr. Brown.

I appreciate that. How often in these experiments do you see the kind of self-mutilation that we saw in the Silver Spring situation?

Dr. Adams. With respect to the Taub case, it is a fairly common observation that animals who have been treated such as these which do not have sensation on the ends of their limbs will attempt to mutilate themselves. There are procedures that can be followed to try to minimize that such as covering the hands, keeping the animal from being able to actually reach the limbs by putting protective guards around the neck so the animal can be fed and can gain access to drinking but at the same time cannot gain access to the limbs. It is a similar procedure that is used with dogs when you do something in the veterinary sense to prepare a limb and you do not want them to bite at it and pester it. So there are a number of procedures that are certainly appropriate in the postsurgical treatment of these animals.

Mr. WALGREN. Is there anything in the system that would increase the level of care when you are dealing with an experiment that results in that kind of physical destruction?

Dr. ADAMS. In terms of monitoring, is that what you are thinking of?

Mr. WALGREN. Within the association. I am thinking of Dr. Butterfield's association, but I would be interested in any suggestions you might have that would strengthen our ability to know that what is going on in circumstances like that is seen by a number of people.

Dr. ADAMS. I would think certainly that a veterinarian would be a prerequisite before the project could be funded and begun, and certainly an animal care committee would be an active ingredient in the review process. Perhaps there should also be required periodic monitoring and reporting on the nursing care and recovery of such animals. I think all of those would be the kinds of things that would make available documentation as to how the animals were doing.

Mr. WALGREN. So you come back to the full functioning of an animal care committee. One of the problems in the Silver Spring incident, as I understand it, is that the committee did not function.

Dr. BUTTERFIELD. One of the main things as far as I am concerned is to keep the facility beyond reproach so that you or your wife or your child's first grade class could come any time, night or day, see our facility and go away with a good feeling about what we are doing.

Dr. ADAMS. I happen to have the dubious distinction of being the chair of the University of Texas medical branch which oversees all human research which is done at that institution, as well as being the chair of CARE at APA. One thought comes to mind, and that is that as part of an IRB operation, continuing review of all ongoing research is an essential part. A similar type of review mechanism not only serves to keep the IRB on its toes, as Dr. Butterfield indicates, but it keeps investigators on their toes and it keeps the institution on its toes, and that type of a process might certainly be one that could be given some serious consideration.

Mr. WALGREN. Dr. Butterfield, you mentioned that the animal population seems to expand when available money expands. Are you satisfied that the research that would be approved at the margins—the next project after we have funded what we are funding now, and extrapolating that to the greatest degree—is goal-oriented enough that it is valuable? Or is it a case of a university establishment of relatively great size and getting larger in this country—or at least our graduate degree population is getting larger—where the justification of the role comes from conducting experiments that have animals involved and the prestige that would be associated with that within one's profession. Does that then become a driving force in the system to approve the research?

Dr. BUTTERFIELD. As far as the individual investigator is concerned—I will use myself as an example—I would be lying to you if I did not tell you that pride certainly played a role in the things that I am doing, and prior to coming to Georgetown, I was in veterinary academia and liked it very much, but I must tell you I have a tremendous feeling each morning when I shave that I can look at myself in the mirror and say maybe today you can increase the contribution that you are making to mankind. I know that sounds corny, but indeed that is my motivation.

Mr. **Walgren**. I am thinking of what the perspective is on the approval of funding from the Federal level. I feel more responsible for that than some of the things that might be approved from university funds. From your knowledge of the profession, are you satisfied that the experiments that are funded from the Federal level are making a truly significant contribution to our understanding? I am talking about the experiments at the margin—those experiments that are the next to be funded.

Dr. **Butterfield**. I would say the peer review system as employed by NIH is very stringent. I can speak again as one who has had grants rejected. I hate to admit the fact I have written proposals that have been rejected, but indeed they are very stringent, and there are usually 20 or 30 individuals that sit on the council and look at this very, very carefully.

Mr. **Walgren**. Is it your experience that in some of the work that you have seen being done investigators are really just looking for something interesting which would justify further funding, or experiments being conducted in order to seek Federal funding?

Dr. **Butterfield**. Each investigator has his own field, and the investigator feels his research is very important and is going to make a contribution. That is my experience with the people at Georgetown, those physicians I deal with who are also involved in research. Each effort in the research field at least at Georgetown I can tell you it is pretty much clinically oriented, that is, what is going to be the benefit of this research and how can it be applied in man? That is truly where we are at Georgetown. I cannot speak to you in terms of behavioral research. I do not know the answer to that.

Mr. **Walgren**. You are not involved in behavior research; is that right?

Dr. **Butterfield**. Right.

Mr. **Walgren**. Physical medicine.

Dr. **Butterfield**. Exactly.

Dr. **Pallone**. Mr. Chairman, I think I was kind of hearing dollar signs when you asked your question, and if I am misinterpreting, forgive me; but if the question really is would the causes of academic science in the Nation's universities be badly hurt or crippled by, for example, a 30-percent set aside from NIH funds to find alternative methods, the answer to that is yes. Academic science is going to be crippled by any set aside, but, you know, we can learn to live with 3 to 5 percent. We could not live with 30 percent without in fact bringing to a halt lines of investigation that may not have clinical applicability today but may 3 years from now.

Mr. **Walgren**. Would you agree that there ought to be a certain effort made to develop and promote alternative testing over and above the present level of effort? For instance, suppose you were allocating dollars and trying to direct the investment to result in the greatest benefit over a multiyear period, and you saw so much testing on live animals and so much testing going into alternative-type tests. Would you allocate any of your dollars toward developing and promoting alternative testing?

Dr. **Butterfield**. If I had the money, absolutely. If I were allocating the money, if someone showed me a proposal that could perform the same function, the same use, without using animals, absolutely.

Mr. **Walgren**. Even on an investment basis would you agree it would be wise for anyone looking at longrun progress of the knowledge to invest a certain amount, the amount being unstated, in developing initiatives in alternative testing?

Dr. **Butterfield**. I do not know it is necessary to invest money to develop the initiatives. Perhaps it is necessary to put in place in NIH some part of the agency that looks at, or that would consider, the alternative methods that are proposed.

Mr. **Walgren**. Is there anything in basic research to develop alternative testing?

Dr. **Butterfield**. We have a situation that I know of at Georgetown where a drug was developed via the use of a computer. It was predicted via computer that a drug for urolithiasis would indeed dissolve urinary calculi. I think those procedures are being used, those alternate methods. It is a lot cheaper to do it on a computer than to test 5,000 animals, but ultimately the prediction of the computer has to be tested on animals.

Mr. **Walgren**. Yes, and I am sure no one would ever doubt that, but the initial work might be helpful in reducing the numbers involved. Looking at the range of research funding, do you believe a certain amount of funding should go into basic research to develop alternatives? Getting away from the question of major set-asides, should not a certain amount of money go toward developing, through basic research, new methods that would use alternatives?

Dr. **Butterfield**. I am not sure it is wise to earmark money for that purpose. I would say if the proposal arrived at NIH and it looks like an outstanding proposal then it should be funded, but I am not sure we should say 10 or 20 percent of the budget—I think it is disastrous to do it that way.

Dr. **Adams**. I would agree. I think the way to go is to use the peer review process to look at the scientific merit of any proposal. If it happens to be a proposal involving alternative methods of research, it should be looked upon on its own merits and if money is appropriated, fine.

Dr. **Pallone**. If I may, Mr. Chairman, the present process used by Federal funding agencies in announcing priorities versus removing from the entire pool of dollars a certain proportion, prioritizing versus setting aside, I think are very different processes. One is not violative of the continuing process of the basic scientific inquiry, and the other seems to me radically intrusive.

Mr. **Walgren**. If you were in a private business and you saw a market developing, as the market for alternative testing has, would you not then be willing to invest some of your resources in pursuit of that developing market? If, for example, a considerable amount of testing has gone in one direction, you could extrapolate and project that more testing is going to be done in that way in the future. So you might want to encourage that to happen by specific investment. Would that not make sense?

Dr. **Pallone**. I would say, Mr. Chairman, a specific investment though at the expense of what? That I think is the key issue, and I would go back and make a distinction between prioritizing and setting aside.

Mr. **Walgren**. If I were president of a small company and I had $100 to work with and I saw a growing trend line, you can bet I would take $6 and throw it in that direction, even at the expense of a current salesman who would be out promoting my present cash flow. Would not that make sense for the scientific community at this point and particularly with Government dollars, which can be targeted more than other dollars in our society?

Dr. **Adams**. It is very difficult when you talk about comparing the basic scientists and big business. I can think of a number of incentives for big business to look at alternatives such as tax breaks and things of that nature, Government contracts, whatever. Basic science has come to approach the problem from a different perspective.

Mr. **Walgren**. But is there not common ground in the fact that we are trying to decide what the most productive use of certain resources available to us will be over a 10-year period, and business is trying to decide what is going to be the most productive use of dollars that are presently available to them? I believe that they would make certain investments, even set asides in areas that they could see developing. If General Motors, for example, did not set aside money for development they would be going nowhere.

Dr. **Adams**. I agree business would. My question is, would the basic academic scientific community do that, because they come at science from a different approach? They are not always looking at what the product is going to be in terms of a payoff. They are looking at it more from the scientific question of, what is the problem that needs to be solved? It is not necessarily focusing on a commercial application.

Mr. **Walgren**. I admit the individual scientist might look at the specific problem he is attempting to solve but the director of NIH has to ask himself the question of: Where will we be 10 years from now with this investment of resources? My instinct is that he has an investment decision to make.

Let me ask whether there is any way to encourage the reduction of the use of animals in instruction courses in our university systems. I realize we use many animals in that area and some of it is very essential for a well-trained future scientific community. Do you feel that we have any checks that would convince a noninvolved person that such use is being held to a justifiable minimum?

Dr. **Butterfield**. Departmental budget certainly dictates. That is No. 1, an important consideration. For example, one of the other areas that we are involved with at Georgetown is we offer a course in advanced trauma, life support program for the American College of Surgeons. There has been talk about manikins and that sort of thing in terms of reviewing with physicians some of the emergency procedures that they might use in the emergency room. But when it comes down to the actual instructional use of animals, then animals are very important. A living organism is important as far as getting these concepts and getting the art of doing what they might do to you or I tonight after an automobile accident. These are important things, and so animals are important in that sort of situation.

I would say the same thing goes for veterinary academia. I cannot train veterinary students to become veterinary surgeons unless I use live dogs and cats. It is that simple. That is part of their training, and there is no way I can develop some sort of computer model or a manikin that simulates your pet dog. It is important that these kids be taught how to deal with these sort of things on the population they are going to practice on.

Mr. **Walgren**. Mr. Rheem.

Mr. **Rheem**. I have a question for Dr. Lowe. We have heard that one of the possibilities for addressing the problem of mistreatment of animals is to put lay people on the animal care committees. Is there some other means of oversight since the animal care committees cannot control the daily mistreatment of animals? For example, we heard testimony of one researcher who said he was going to choke the animal until it did what he wanted it to do. What sort of daily checks and balances are there on use of animals?

Dr. **Lowe**. I would not have great concerns, and I do not think the large proportion of the scientific community would have great concerns with an appropriate so-called lay person on animal care committees, or better perhaps at the granting agency level if by appropriate it clearly means someone who has an interest in these issues and some background in evaluating research methodologies. But it certainly would not have to be a scientist, necessarily.

The second question, what goes on on a day-to-day level, gets back to what many people testified yesterday. The institutions themselves have institutional policies. We heard about several of those today. Each university has a slightly different organization in terms of its research administration, but in the end each institution is responsible for its own house, and it meets these responsibilities in whatever local ways it has, but then again it has the two vehicles which you heard so much about, the Federal law and the animal welfare agency or the NIH guidelines. The enactment of these is to have an animal care staff and a technical staff. By technical I mean the people who are actually attending to the animals each day, and there are a lot of interesting points the committee could consider in its subsequent deliberations about the nature of the technical staff at an institution and the arrangements each university makes to follow through down to the individual animal level, which has been the concern of the committee, and it is the concern of the universities that use animals. I would think that you could investigate the systems of organization within universities and research institutions that exist for this. Most of us think the ones we have are good, but clearly there must be many cases where they are not so good, and one could investigate those and find ways of improving them.

Mr. **Rheem**. You mentioned, Dr. Adams, APA deals with the ethical issues and ethical questions, and it has been in existence since 1925. In the last 5 years how many cases have come up before that committee?

Dr. **Adams**. Before answering, Mr. Rheem, I feel I must clarify something. APA deals with a variety of issues through several committees. CARE, the committee that I chair, focuses primarily on animal research and experimentation. While ethical issues are part of our jurisdiction, the primary investigatory panel for such issues is the Committee on Scientific and Professional Ethics and Conduct. This being the case, I'm afraid that my area of expertise does not extend to the activities of the Ethics Committee, except in the most superficial way. However, I believe that principle 10, which is the principle that deals specifically with the care and welfare of animals, has been added to the Ethical Principles of Psychologists relatively recently. Prior to that time there was no clear-cut mechanism other than the presentation by some individual of what they viewed as being an abusive situation to the committee. They could bring it to the Committee on Animal Research and Experimentation's attention. I would say in the last 5 years, certainly in the last 3 years since I have been affiliated with the CARE committee, there have only been two or three instances.

Mr. RHEEM. This involved principle 10?

Dr. ADAMS. Basically principle 10.

Mr. RHEEM. Of those two or three instances, what sort of action was taken?

Dr. ADAMS. Since we were not under the ethical standards at that time—that has only been a recent change—we basically would investigate it as much as we could by looking into contacting people who might know something about the case, talking to individuals who knew the individual in question, and then making some correspondence back to the person who referred it to us. If it was substantiated, and in none of these cases could we have any substantial evidence, we could have perhaps gone to the institution directly and tried to operate through normal administrative academic channels. But in these two cases that I am thinking of there was not enough evidence to really pursue.

Mr. RHEEM. So basically since this committee has been established there have been no proven cases of ethical misconduct?

Dr. ADAMS. That is right.

Mr. RHEEM. Is it the position of APA that this misconduct is not occurring?

Dr. ADAMS. No, it is not the position that it is not occurring. It is that we are not aware of it if it is occurring.

Mr. RHEEM. So basically the case coming up with Dr. Taub may be the first case where you could not say that substantial evidence didn't exist?

Dr. ADAMS. This is correct. This will be in a sense a true test case of the ethical principle.

Mr. RHEEM. Thank you.

Thank you, Mr. Chairman.

Mr. WALGREN. Thank you, Mr. Rheem.

We will certainly look forward to the formal submissions of your society's proceedings in the Taub case.

I want to thank the members of the panel very much for their contributions which have been helpful, and I want to express my appreciation and respect for the interest that many of you in the public have given to this hearing. I hope we can make progress in this area toward goals that can be widely agreed on, and I also want to underscore that the Congress does not move unless there is a very broad consensus and urging from the public. I hope that you will play an active role in helping on that level also.

Thank you very much for coming.

[Whereupon, at 1:45 p.m., the subcommittee adjourned.]

APPENDIX I

STATEMENTS FOR THE RECORD

TESTIMONY FOR THE SCIENCE, RESEARCH, AND TECHNOLOGY SUBCOMMITTEE OF THE HOUSE

REPORT ON NATIONWIDE THEFT OF PRIVATELY OWNED DOGS AND CATS

ACTION 81 INC.
Route 2, Box 151
Berryville, Virginia 22611
Mary C. Warner, President

The Honorable Douglas Walgren, Chairman.

Mr. Chairman, on behalf of ACTION 81 INC., a national citizens' action organization working since 1974 to expose and prevent nationwide theft of dogs and cats, I wish to thank you and the members of your committee for the opportunity to present this testimony.

Strongly based in Virginia, ACTION 81 has contacts and affiliates in forty states across the country. Included are national, state, and local dog and cat clubs, law enforcement agencies, humane organizations, concerned legislators, members of the legal and medical professions, tattoo services, the media, and owners of missing dogs and cats.

Members of the ACTION 81 network compile statistics on missing animals and work at the grass roots level to alert communities to the presence of organized pet larceny rings.

ACTION 81 acts as a clearing house of information on dog and cat theft and distributes nationally a great deal of educational material which is included with this testimony.

The LOSS of a companion animal is now recognized by the medical community as a significant shock and threat to the health and well being of the human owner. LOSS BY THEFT adds another dimension t the mental agony: the unresolved question of WHO stole the animal, WHERE it was taken, and FOR WHAT PURPOSE.

The FINANCIAL LOSS to the owner of a stolen purebred dog or cat can be compared to the loss by theft of a television set and upwards in value to that of a foreign car.

ORGANIZED THEFT of privately owned dogs and cats is NATIONWIDE. Articles on this subject have been published in major newspapers across the country. A list of these newspapers is included with this testimony as well as a list of areas from which owners of missing dogs and cats have called or written to ACTION 81.

Theft of a dog or cat is not an easy crime to prove. Possession is about 99% of ownership. Since instances of theft are rarely observed by someone willing to "stand up in court," ACTION 81 contends that dogs and cats disappearing with cogent and convincing indications of theft should be considered STOLEN.

Dogs are "disappearing" off their chains, out of homes and cars, collars cut, chain link fences cut, picked up by vehicles with false license tags, by persons posing as humane agents or animal wardens. The methods are the same from Seattle to Dallas to Boston to Miami. Rural areas are as hard hit as urban. The situation could well be termed a "National scandal."

ACTION 81 has carefully obtained statistics on dogs "disappearing under circumstances of theft" in the state of Virginia. A network of lost pet registries, animal control persons, and owners has provided the information for 1979 and 1980 in about 1/5 of the state. The figures for 1981 are running about the same as 1980.

More than 13,000 dogs were reported by their owners as missing and not recovered for the two years. A breakdown of the 1980 figures is also included with this testimony. 8081 dogs. 66% purebred. These dogs are all listed in the ACTION 81 files.

The leading markets for dogs and cats are Research, Dealers, Breeders, Pet Shops, Guard Dog outlets, and illegal Dogfighting Rings.

Research laboratories, medical and veterinarian schools are considered to be the largest and steadiest consumers of dogs and cats.

ACTION 81 contends that the system of procurement of laboratory dogs and cats is ENCOURAGING AND FACILITATING THE THEFT OF PRIVATELY OWNED animals by unscrupulous persons for profit.

The Animal Welfare Act of 1966 and its subsequent amendments require federal registration of research facilities, licensing of dealers who supply them, and a system of records on all animals involved. Humane standards of housing and transportation are defined. Agents of the U.S.D.A. are charged with enforcement.

Research facilities obtain their dogs and cats from licensed federal dealers, pounds legally empowered to sell, and in some cases from companies raising animals for laboratory use. This system sounds good on paper and should not open the way to theft, but it does.

FOR INSTANCE: a Research laboratory has a contract with a dealer for a set number of dogs per month, dogs of a specified breed, weight, type of coat. The dogs must be healthy, tractable; not the mange infested, half-starved stray traditionally found in dog pounds.

Additional dogs and cats may be needed with short notice to the dealer if certain experiments or increased student loads require them.

How can the dealer know that the dogs SPECIFIED in his contract with the laboratory will be available at the pounds from which he buys? WHERE CAN HE FIND THEM?

A law was passed in the state of Virginia last winter which prevents OUT OF STATE DEALERS from buying dogs at Virginia pounds. Powerful testimony described the weekly buying trips through the state by the large scale dealers, the trucks capable of hauling several hundred dogs, the stacks of cats in chicken crates, drivers with keys to the pounds, collections of dogs in barns on back roads, picking up and hauling in the night, illicit payments in cash, forged records, blanket health certificates, flagrant violations of the federal requirements of humane housing and transportation, high incidence of theft in areas adjacent to the pick-up points.

It is common practice for dogs and cats purchased in one state to be sold to laboratories in another state. A form of "laundering."

Research may not INTEND to purchase STOLEN dogs and cats, but too often the technicians who receive the truckloads of animals pursue the policy of "no look, no see." Reports from ACTION 81 laboratory contacts indicate shipments of "beautiful dogs and cats," many spayed and neutered, some with tattoos that are never traced.

Research MUST take more responsibility for the SOURCES of its dogs and cats. It is not enough to state that their purchases are from licensed federal dealers and consequently preclude stolen animals in the collections.

Records for dogs and cats are EASILY "doctored." USDA is neither staffed nor funded to provide effective enforcement of federal animal welfare standards. Research MUST check for tattoos and be suspicious of stolen animals in every shipment.

The laboratory contracts for specified breeds and types of animals by set dates are ENCOURAGING THEFT of taxpayers' property.

The intensity of grief and anger suffered by the human victims of dog and cat theft is fast becoming a compelling and cohesive force for citizens' action power on a nationwide scale. The movement to stop and expose organized pet theft cannot be diverted or swept under the rug.

If the crime is allowed to continue unchecked, the only recourse of the dog and cat owners will be restrictive legislation at the local and state level to ban the sale of all pound animals to dealers and research.

Research may yet be FORCED to raise its own "prime quality" laboratory dogs and cats and/or to find ALTERNATIVES.

Mr. Chairman, ACTION 81 INC. and the millions of owners whose dogs and cats are stolen each year THANK you and the members of your committee for your attention to this testimony.

Statement of the
American Academy of Orthopaedic Surgeons
on the Use of Animal Models

Submitted to the
Subcommittee on Science, Research and Technology

The American Academy of Orthopaedic Surgeons, on behalf of its 10,000 members, is pleased to submit this statement concerning the use of and need for animal models in basic and applied biomedical research.

One of the major purposes of the American Academy of Orthopaedic Surgeons is to foster, promote and encourage investigative knowledge of orthopaedic surgery and the prevention of diseases and disorders of the musculoskeletal system. The cost of musculoskeletal disorders to society, in terms of lost earnings and medical expenses, exceeds $30 billion per year. Thus, the need to continually search for ways to prevent, diagnose and treat these diseases and disorders is obvious if we are to provide a better quality of life for future generations.

We would like to congratulate the Committee for bringing the issues of animal welfare and biomedical research into a forum of free and open discussion. For too many years, these issues have been clouded with half-truths, innuendos and, unfortunately, sometimes with deliberate misstatements.

The contribution of biomedical research using animal models to improve the quality of human life and prevent human disease has been significant, especially over the last four decades. However, the Subcommittee should note that while these animal models have contributed to an understanding of human disease, they have also contributed significantly to the survival and improved health of domestic pets and farm animals. For example, veterinarians can now perform remedial operations on the family pet, especially cats and dogs, with every hope of success due to the development of small animal anesthesia which came about from the search for better human anesthetics. Also internal fixation of long bone fractures and canine total hip joints were derived from successful orthopaedic research.

The use of an animal model is oftentimes preparatory for human experiments. Without this first step, it would have been impossible to achieve a high rate of success when the work was first transferred to human subjects. For example, after a small number of animals had been used to work out methods for dealing with circulatory disorders, such as heart disease, atherosclerosis, and "blue babies," operations were then performed for many years on humans that could only be described as "experimental" because the outcome of such operations could not be predicted with any degree of certainty. Thus, there are millions of people alive and productive members of society today because of such research, and we hope the Subcommittee will hear from them. However, we fear that this will not happen because they are not part of an organized group. Using rabbits, a model system has been developed in which joint changes grossly and histologically similar to human rheumatoid arthritis can be consistently reproduced; thus allowing the laboratory study of many treatments before clinical trials are undertaken.

The legislation before the Subcommittee calls for ways to promote humane and appropriate uses of animals, including alternatives to animals.

It should be noted that the scientific community is virtually unanimous in its desire to use animals only when absolutely necessary. Scientists would prefer not to use animals if results could be obtained in other ways that are both scientifically valid and acceptable to regulatory authorities. Some progress has been made in the development of methodologies other than the use of animal models, and these alternatives are in fact being substituted for animals in some areas of research.

There are other incentives for the research community to utilize other methodologies, namely the continuing rising cost of buying, caring (in accordance with published regulations and guidelines) and feeding of research animals. Data obtained from the Federal Government reveals that in 1980, 35% of the National biomedical research budget is for research projects involving the use of laboratory animals, an apparent decrease from the 44% figure reported in FY 1968.

As for the treatment of research animals, the Academy fully supports the humane treatment of animals; however, we do recognize that there are isolated cases of abuse. We believe that such offenders should be denied access to public funds unless they are willing to comply with Federal regulations and guidelines dealing with the care and feeding of research animals.

The research community looks critically at the scientist who wishes to use animals in his work. Prior to receiving funds, the scientist must demonstrate that the experimental procedures contemplated are acceptable; and second, it must be documented that the work is not repetitious and therefore justified or that there is no alternative method for achieving valid results.

We are concerned that the various legislative proposals before the Subcommittee would (1) place the review of scientific protocols in the hands of those not knowledgeable about biomedical research; (2) increase the cost of research; and (3) would divert sizeable sums of money from a shrinking Federal budget to search for alternative methods which would normally evolve from the conduct of basic research.

The Academy strongly urges the Subcommittee not to pass legislation which will place heavy burdens on current and future research. The use of animal models in research is a complex issue of great importance to our society; and therefore we recommend that prior to passage of legislation, the Congress direct the undertaking of a careful and critical study to look at the possibilities of alternative research models. However, we believe that strict enforcement of existing regulations is as appropriate a response as the passage of new legislation; and thus this avenue ought to be seriously considered.

Statement of the
American Association for Dental Research
on the Use of Animal Models

Submitted to the
Subcommittee on Science, Research and Technology

The American Association for Dental Research, which represents more than three thousand researchers in the United States, is greatly concerned about the proposed legislation to further regulate the use of animals in biomedical research. The Association respectfully requests that this statement be included in the records of the hearing to be held by the Subcommittee on Science, Research and Technology regarding this legislation.

We believe that such legislation is unnecessary, would curb scientific advances, would increase the costs of conducting research, and, in general, is not in the public interest.

Nearly all scientists who must use animals in their research treat these animals in a humane way, if only because they know the validity of their research would otherwise be compromised. Furthermore, when valid results can be obtained by investigations conducted *in vitro*--*i.e.*, in non-living systems--most researchers actually prefer those methods.

The use of animals in research has declined substantially over the last decade, and there are several reasons for this decrease. First, the costs of purchasing, caring for and feeding research animals, in accordance with existing regulations and guidelines, have risen sharply; and, second, the natural curiosity of scientists has led to the development of alternative mechanisms for achieving valid research results.

It is, however, a fact that many of the major advances in medical science which we all enjoy today could not have been achieved without the use of animals. All of the antibiotics, vaccines, and pain relief drugs could either not have been developed, or would have been severely curtailed without the availability of animals in biomedical science. Imagine, for example, the devastating consequences if the development of the poliomyelitis vaccine had been delayed by five years because there was a curb on the use of animals. Indeed, the thalidomide tragedy occurred because insufficient work was carried out in animals. If the drug had been tested in pregnant animals, the disaster might well have been averted.

Dental research depends heavily on the use of experimental animals in order to conduct investigations. It is essential to use animal models to study the etiology of dental caries and periodontal (gum) diseases, and to develop methods for their prevention. Treatment of both these diseases costs the U.S. taxpayer billions every year.

Moreover, thousands of babies are born each year with craniofacial deformities. It is essential to use animals to study the etiology of these conditions, and to develop materials and surgical techniques for their correction.

We believe that the passage of any of the proposed bills would hamper research and thereby do a grievous disservice to the American public. Existing legislation and guidelines are adequate to ensure that animals are given the humane treatment and respect that they deserve.

We fully appreciate the sensitive nature of this issue, and we commend the Committee for holding open hearings; however, we urge the Committee to move cautiously on this matter, or the health and well-being of future generations may be seriously jeopardized.

If we can be of any assistance in providing additional information on this subject, please do not hesitate to contact us.

American College of Cardiology

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November 13, 1981

Honorable Doug Walgren
Chairman
Committee on Science and Technology
Subcommittee on Science, Research and Technology
U.S. House of Representatives
2319 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

The American College of Cardiology, a professional medical specialty society, representing over 11,000 physicians, scientists, and educators who specialize in diseases of the heart and circulatory system, appreciates the opportunity to contribute to the discussion relating to the use of animals in research. We believe these hearings have given the scientific community the chance to discuss competing views on appropriate biomedical research roles and activities.

We have reviewed the testimony presented and submitted to the Subcommittee for the October 13 and 14 hearings. Our own analysis as well as that of others leads us to strongly oppose H.R.556. This legislation, if enacted, would cause already limited fiscal resources to be drawn away from research in areas for which there are no alternative methods of research.

One can probably understand our position more fully when one considers the significant effect animal research has had in the cardiovascular field.

The following is a short list of positive outcomes in the cardiovascular field (also noted by the Association of American Medical Colleges) which have relied heavily on animal research for their validation:

1. Atherosclerosis, the leading cause of death in the U.S.; cell cultures and biochemical and immunologic analyses may yield valuable data at the cellular and potential therapy, but definitive validity must still be established in intact animals.

2. Cardiac valvular surgery for patients with congenital and rheumatic heart disease;

3. Hypertension and the role of the kidney in both cause and effect that led to the development of its treatment with diuretics;

4. Bypass graft surgery in patients with coronary artery disease;

5. Cardiac pacemakers for patients with disabling arrhythmias;

6. Therapy to decrease the size and severity of myocardial infarction;

7. Neurologic diseases and impairments including strokes, multiple sclerosis, amyotrophic lateral sclerosis, epilepsy, myasthenia gravis, brain and spinal cord tumors;

8. Transplant surgery, initially of kidneys and now of other organs, including: pancreatic transplants for diabetes mellitus, liver, lung, heart and intestinal transplants.

We cannot let up in our quest to understand and conquer the number one cause of death, diseases of the heart, which would occur if H.R.556 became law.

Knowing that alternative methods of research can only complement animal research in most cases, how can we be required to over-rely on in vitro methods, which cannot replicate many mammalian responses?

Therefore, we recommend that individual members of this committee and the Congress not reduce substantially the chances of reaping similar future human and scientific benefits from humane and appropriate use of animals in biomedical research. Adopting a cumbersome mechanism requiring the use of alternative methods, as described in H.R.556, would deplete the already inflation-ravaged biomedical research effort.

Sincerely,

Dan G. McNamara

Dan G. McNamara, M.D., F.A.C.C.
President

AMERICAN HEART ASSOCIATION

DALLAS, TEXAS

The American Heart Association on behalf of its 20,000 physician and scientist members and its 110,000 volunteer members who are consumer advocates for the patient with cardiovascular disease, submits this testimony in association with the Subcommittee hearings on the use of animals in medical research and laboratory testing because of its deep and continuing concern with biomedical research. Biomedical research is the key element in the discharge of the Heart Association's mission, "To reduce premature death and disability due to cardiovascular disease". Since its establishment as a voluntary health agency in 1948 a substantial proportion of the dollars publicly contributed to support the American Heart Association have been invested in biomedical research. In the current year, for example, the American Heart Association support of research into the causes, prevention and treatment of cardiovascular diseases will total in excess of $24 million.

The establishment of the American Heart Association in 1948 coincided with the establishment by the Congress of the National Heart Institute (now the National Heart, Lung, and Blood Institute). During the ensuing 34 years there has been close coordination and interaction between the American Heart Association and the Institute in a dedicated effort to direct funds into research which will diminish the extraordinary impact which disease and disability from disorders of the cardiovascular system has on the health of our nation and on the loss of productivity from our economy.

It is clear from the results recorded in the last decade that the new scientific knowledge produced by this research has materially altered the outlook with respect to the control of these diseases. In the report of the NHLBI Working Group on Arteriosclerosis, which was published in July, 1981, the data are clear and encouraging. During the ten years from

1968-1978 there has been a reduction of 27% in the yearly death rate as a consequence of arteriosclerosis of the coronary arteries which leads to heart attacks. Over the same interval from 1968-1978 there were even more dramatic results from the direct management of arteriosclerosis of the cerebral arteries which result in strokes. The death rate from strokes has diminished during this period by 40%.

The discoveries which converged to permit these dramatic results all can clearly be traced to the successful conduct of research involving studies with animals -- in most instances with intact, anesthetized animals. Many factors contributed to this much desired outcome. For example, people now are being saved from death following heart arrest or a myocardial infarction because of the successful application of techniques of cardio-pulmonary resuscitation. These techniques could never have been successfully applied to humans had there not been an interval where the foundation of the technique was developed in experimental animals.

Surgical techniques are being used now to save victims of heart attack and to reestablish blood flow to the affected portions of the heart muscle. None of these techniques could ever have been developed to permit the surgeon to approach the human heart without studies in whole animals. Moreover, each successive class of cardiovascular surgeons must use and develop their skills successfully in animal models before they approach the human patient.

A substantial portion of the reduced mortality from stroke can be ascribed to successful methods for the pharmacological treatment of people with high blood pressure. Before any of these lifesaving medicines could successfully be used in the therapy of human patients it was critical that their effect on the total cardiovascular system be tested and verified in animals whose cardiovascular systems were comparable to those of human beings.

One fundamental characteristic of the cardiovascular system which does not allow investigators to study simplified models -- such as computer models and bacterial life forms -- is its extraordinary complexity. Every organ system in the body is nourished and functional because blood flow to the tissue is maintained in exactly the right proportions to deliver the nutrients which are necessary to the life function and to carry away the waste products generated by that life. And yet, the cardiovascular system is a circular one in which all of the parts of the system are interlinked. On this complex system is superimposed a control system involving nervous and hormonal influences which interact in complex and interdependent ways.

The demonstration therefore that any kind of experimental hypothesis about the circulatory system is proved depends on experiments in the whole system. The validation of any therapeutic procedure must prove that in the intact system there are no untoward hidden consequences. On this basis the Heart Association believes that the continued flow of the kind of information which has permitted us to be effective in performing our mission will be reduced if access to experimental models of the whole system furnished by experimental animals is in any way diminished.

During its entire history of support for biomedical research the American Heart Association has subscribed to the highest standards of humane treatment of animals. We have followed faithfully the evolution of standards prescribed for animal care by the Federal government and we have insisted continuously that these standards must be a part of the research supported by the Association. Our experience has been that in the medical centers, where the scientists we support work, these standards are locally monitored and faithfully followed and enforced.

To the extent that these widely accepted principles are not adequately monitored and require further enforcement the American Heart Association would be sympathetic to additional steps which might be needed to insure that laboratory animals receive humane and compassionate treatment.

Conversely, the Association is extraordinarily concerned about the kind of misguided efforts that seem to be reflected in the philosophy underlying H.R. 556. To the notions expressed in this Bill the Association is adamantly opposed and greatly alarmed about the potential serious effects it would have on the pursuit of the mission of the American Heart Association -- and to the pursuit of biomedical research in general.

A major concern of the scientists who are being supported under Heart Association programs and under NHLBI programs is to acquire and use the most cost-effective methods which are available reliably to answer the current critical issues to be resolved in a series of questions about a complex living system. Alternative methods using less than a whole animal model are continuously evolved in the orderly pursuit of science. Alternative methods, however, cannot be proposed unless the fundamental knowledge exists to permit precisely defined input to a simplified model.

We are acutely aware that -- while we have made extraordinary progress in our struggle against cardiovascular disease -- that disease still remains the number one killer in our society. The knowledge which permitted our current successes was developed laboriously in the numbers of laboratories over a long interval of time. Were the continued flow of such new information to be impeded, to become faltering, or to disappear, the rates of improvement in these disorders could no longer continue in a favorable trend. Such an decline would inevitably result if critically needed research monies were diverted in the manner suggested by H.R. 556.

Funds which have been directed to fundamental research in the NHLBI over the last several years have fallen far short of the amounts necessary to maintain a constant level of investigation into cardiovascular disease. Currently, these funds are facing the likelihood of even greater reduction. The certain consequence of reductions already proposed is that substantial numbers of promising new research projects will not be funded and must be postponed or perhaps lost forever.

Such a reduction would also worsen the current alarming situation in which the field of biomedical research faces ever increasing difficulty in attracting talented and dedicated investigators in their early years into a career in research. To so diminish this scientific cadre -- on which the research advances of future years most surely depends -- would be to deny future generations the benefits of those life-saving advances.

In summary, the American Heart Association believes that to divert a substantial portion of available research funds by a mandate to look for speculative and currently unobtainable alternative methods of conducting biomedical and behavioral research would compound an already serious erosion of our ability to come closer to the understanding necessary to eradicate cardiovascular disease. The American Heart Association strongly opposes H.R. 556 which it believes would impose unwarranted obstacles to the continued effective attack on disease conditions of extraordinary importance to the lives, the health and the well-being of all Americans.

Thank you for the opportunity to present these views on this important issue.

James A. Schoenberger, M.D.
President

10/22/81

Statement of the American Humane Association in support of Bill H.R.4406 proposing amendments to the Animal Welfare Act (P.L.91-579) with the amendments of 1976 (P.L. 94-279).

The American Humane Association recognizes the need to use laboratory animals in biological and biomedical research, testing,and teaching. A few satisfactory alternatives to the use of animals have been found, and it is our hope that more will be forthcoming, particularly in the area of routine safety testing.

Clearly the members of our organization would welcome the day when we no longer need to use animals to find answers to our problems. However, we must also recognize that the time when a significant reduction in research animal use can be achieved is still a considerable way into the future. In the meantime animals must be used if our society is to maintain and improve the quality of life. Society cannot now abandon its committment to the acquisition of knowledge and its intelligent application to the benefit of mankind. Therefore, our principal concern must be the welfare of laboratory animals now and in the forseeable future.

American Humane is unique in that it addresses the issue of child abuse as well as animal welfare. We pay respect both to the dignity of man and animals. The relevance of our dual committment lies in the dilemma posed by animal experimentation, namely the amount and degree of animal suffering that can be justified for human benefit. Where, and how, is the equilibrium established between human need and the use of animals in biomedical research?

Through taxation, payment for service, and product acquisition we may have some idea of the price we monetarily pay for technical advances. However, do we know the price we are paying morally in the use of animals in research, in order to advance the frontiers of biomedical science? Is the price too high? Are we debasing ourselves as civilized human beings in our efforts beyond a certain point to seek further knowledge? We believe that these are the questions informed citizens ask in an attempt to establish a compromise solution to the dilemma with which they can be comfortable as civilized men and women. In order to be able to reach a compromise or pragmatic solution, however, it is necessary to be aware of the work carried out with animals in behalf of society as a whole, and to be assured that the use and care of the animals is sound.

The compromise solution deemed acceptable by contemporary society becomes the normative ethic. The normative ethic must be established by society as a whole, of which the biomedical scientist is but a part. The people must know, and agree with, the ethical standards applied to the use of animals in research, testing and teaching. Furthermore, the people must see that those ethical standards are consistently applied. The responsibility of bioscientists as an integral part of society is to evaluate the work in the light of contemporary ethical standards, and to ensure that those standards are adhered to.

Assurance of sound project evaluation and ensurance of standards of animal use and care now becomes the vital issue. We have examined the current methods of surveillance in detail with our laboratory animal science and medicine consultants and find the present system to be all but totally incapable of ensuring that current ethical standards are being applied.

The Animal Welfare Act (P.L. 91-579, 1970) and the amendments (P.L. 94-279,1976) and more specifically the regulations promulgated thereunder do not cover rats and mice which make up the majority of laboratory animals used annually. Nor do they cover domestic farm animals used in research.

Assurance of compliance with the "Guide for the Care and Use of Laboratory Animals" published by NIH and the "Principles on the Use of Laboratory Animals" originally published in the "NIH Guide for Grants and Contracts," became a contractual obligation of all grantees and contractors in 1979. They do not apply to privately funded research, which with the direction of the present administration may well become predominent in the future. There also appears to be concern that in some cases the assurances of compliance filed with the Office for the Protection from Research Risks do little to reflect the true status quo of animal use and care at the filing institutions.

We have watched the development and emergence of bill H.R.4406 with great interest. We believe that it has very carefully addressed the weaknesses and deficiencies of the present systems. Most significantly the bill places the onus of responsibility, peer review, and day to day surveillance, on the institution at which the research is carried out. The moral responsibility is therefore where it belongs. The federal governments's role is purely to ensure that the full weight of responsibility is consistently borne by the institution, and that the normative ethics of the people approximate those of the scientists therein.

Bill H.R.4406 is one of the best pieces of humane legislation we have yet seen in that it proposes a system of ethical responsibility which may be borne by all concerned citizens. It does not obstruct the process of science for human benefit. It does not demand a burgeoning bureaucracy. Instead, it places the responsibility with those who must be ultimately responsible, and seen to be responsible, if we are to be assured that our continuing human dignity does not rely on covert inhumanity.

AMERICAN PHARMACEUTICAL ASSOCIATION
The National Professional Society of Pharmacists

WILLIAM S. APPLE, Ph.D.
President

October 13, 1981

The Honorable Doug Walgren
Chairman, Subcommittee on Science,
Research, and Technology
U.S. House of Representatives
Rayburn House Office Building, Room 2319
Washington, DC 20515

Dear Mr. Walgren:

The following comments are submitted by the American Pharmaceutical Association for the record of the hearings on the issue of the use of animals in medical research and testing. The American Pharmaceutical Association (APhA) is the national professional society of pharmacists with over 50,000 members who are practicing pharmacists, educators, researchers, in industry and academia, and pharmacy students.

Because of our fundamental interest in helping to assure that the American public has available for use safe and effective pharmaceutical products, APhA and its Academy of Pharmaceutical Sciences has followed closely the issue that is the subject of your subcommittee's hearings. As a result of that continuing scrutiny, the APhA House of Delegates adopted at its 1981 meeting in St. Louis the following policy regarding the use of animals in research.

- The American Pharmaceutical Association recognizes that animal experiments continue to be an essential, and indeed irreplaceable, component of biomedical research and testing.
- When animals must be used for biomedical research and testing, the American Pharmaceutical Association strongly supports humane treatment and adequate regulation, controls, and enforcement of appropriate measures relating to animal procurement, transportation, housing, care, and treatment.
- The American Pharmaceutical Association encourages the further development of methods of biomedical research and testing which do not require the use of animals.
- The American Pharmaceutical Association opposes legislative provisions that would penalize the properly controlled and conducted use of animals for biomedical research and testing.

APhA is aware of and views with concern the emotional arguments being put forth by certain groups opposed to any use of animals in biomedical research, but APhA considers these arguments as lacking scientific validity and substantially overstated. The use of animals in research has been reduced substantially in recent years due to the development of alternative methodology, and that trend will surely continue. Further, APhA believes that existing rules and regulations adequately assure the proper procurement, transportation, housing, care, and treatment of animals that are now used in legitimate procedures necessary for the development and production of modern drug products.

The American Pharmaceutical Association believes that the underlying issue here is good science, and the subcommittee is therefore urged to weigh the testimony with which it is presented in a scientific manner. Your final decision must be based on science, and the public welfare, not on emotions.

Sincerely,

William S. Apple

THE AMERICAN PHYSIOLOGICAL SOCIETY

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9650 ROCKVILLE PIKE
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PHONE 301 530-7164

PLEASE REPLY TO:

October 28, 1981

The Honorable Douglas Walgren
Chairman, Subcommittee on Science,
Research and Technology
2319 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Walgren:

In response to your news release, 97-94, inviting comments on proposed animal legislation, the American Physiological Society, a description of which is enclosed, would like to bring to your attention some items in HR 556 (Research Modernization Act) that are of concern to us. The Act would establish, within the National Institutes of Health (NIH), a Center to study research methods to reduce the use of live animals.

The APS supports the concept of the use of alternative research methods whenever it is possible to replace the use of live animals and still obtain new knowledge to improve the health and well being of both humans and animals. However, the use of animals is essential to the continuous advancement of biomedical research, and in many instances alternatives to the use of animals have not been developed, e.g. research in cardiovascular disease, hypertension, liver disease, nervous system damage, brain function, alcohol and drug abuse, nutrition, reproduction and genetics, the development of life saving medicines, and surgical procedures for animals as well as humans.

Biological scientists are continually striving to develop alternative methods to solve specific research problems. However, the APS questions the establishment of an entire NIH Institute to study one type of research methodology. All institutes utilize a variety of research techniques which include those mentioned specifically in HR 556 as well as whole animal experiments; it is quite common for research to include tissue culture, modeling, animal use, isolated organ systems, computer simulations, etc.

The modern biological scientist is taught and already uses the latest methods of chemistry, physics, electronics, mathematics, statistics, and computer technology to solve many problems and develop new procedures without the use of animal experimentation. In fact, the modern biological scientist, with the use of statistical and biophysical methods and computer technology, is able to perform fewer animal experiments and to extrapolate his findings from a limited number of experiments to new working hypotheses that need not employ continuous animal experiments. We need not be reminded of the great advances made by the discovery of the structure of the DNA molecule - a discovery published 24 years ago without the use of animal experimentation. There is nothing new about using "alternative methods of research;" scientists have been using these methods for many years.

The APS questions the value of the Center, as proposed in HR 556, to further research accomplishments, and is concerned that the methods proposed by the sponsors of HR 556 may be detrimental to the progress of biological and medical science, and to the betterment of all animal life. To support the Center, the Bill proposes to redirect 30 to 50 per centum of appropriations for all research and testing programs involving the use of live animals.

Although only a small part of the national budget supports biological research, diverting such a large percentage of monies from animal research would hinder those programs established to improve human health, environmental quality, and agricultural animal production and also those which assure the safety of food as well as human and animal drugs. To determine the dollar value of each agency's research budget allocated to animal research would require new accounting procedures for research and testing programs conducted by the National Institutes of Health, National Science Foundation, Food and Drug Administration, US Department of Defense, US Department of Agriculture, US Department of Interior, Military Medical Centers, Environmental Protection Agency, and Veterans Hospitals.

The Bill proposes to monitor the animal research of these agencies, as well as their grantees and contractors; to determine the appropriateness of the use of animals for the research; and to dictate when to use alternative research methods. To justify such a monitoring system one would have to be convinced that such alternative approaches would more productively solve biological problems. Only the researcher and his peers have intimate knowledge of a specific research project. To date, the peer review system comprised of knowledgeable scientists, used both intra- and extramurally, has been one of the best methods to validate research approaches, and to eliminate duplication of research.

The APS and biological scientists as a group are concerned for the health and well-being of all research animals. The current NIH laboratory animal guidelines to alleviate animal discomfort are well thought out and have been effective. The American Physiological

Society's *Guiding Principles in the Care and Use of Animals* states that the standards for proper and humane treatment of animals of the NIH Guide be followed for all animals used in research and teaching. Scientists wish to follow these guidelines not only on humanitarian grounds but also for the practical reasons that badly maintained animals do not give reliable results.

It is a fact that the majority of scientists is most concerned that their procedures do not involve pain to the animal. It is also a fact that the majority of biological scientists uses animals in their experiments only if animals are required to solve a biological or health problem, and then in limited numbers. The most important statement to be made, in concluding this point, is that the "public" should know that animal research and testing are methods the biological scientist must employ to improve the health and conditions of life not only of humans but also of other animal species.

We hope your Subcommittee will give serious consideration to the thoughts and recommendations of the American Physiological Society during deliberations on this legislation. If we can be of any further assistance, we would be happy to cooperate with you.

Sincerely yours,

Francis J Haddy

Francis J. Haddy
President

FJH:l
cc: Members, Subcomittee on
Science, Research and Technology

"RESEARCH MODERNIZATION" AND ALTERNATIVES TO LIVE ANIMAL RESEARCH: A POSITION STATEMENT ON BILL HR 556 BY THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

The American Society of Ichthyologists and Herpetologists (ASIH), the major United States organization of professional zoologists studying "cold blooded" vertebrate animals (fishes, amphibians, and reptiles), following Society procedures, has adopted as its collective position the following statement:

The ASIH supports all responsible, rational efforts to improve techniques used in experimental biological studies involving animals so as to minimize both the numbers of animals used and the extents to which incapacity, pain or suffering are caused in experimental subjects. At the same time the ASIH opposes efforts to place arbitrary and unreasonable constraints upon properly planned, appropriately carried out experimental studies involving animals, when these studies have valid scientific research, developmental, or educational goals. HR 556 appears to ASIH to fall into the second group.

The ASIH opposes the passage of HR 556 for three reasons:

1) HR 556 is misguided and tries to legislate impossible actions. It does not take adequate account of two important properties of animals which make its primary stated goal presently impossible to achieve in most situations: First, it ignores the significance and implications of the long and different evolutionary histories of the different groups of animals. With few exceptions, different kinds of animals having different evolutionary histories rarely all do anything, even simple things, in only one way, using a uniform mechanism. Second, it ignores the fact that living systems are variable. Most processes in living systems are sensitive to and affected by many different factors simultaneously. There is always a variable background behind the responses of animals to changes in single factors or small groups of factors. This variability is one of the main reasons making repetition of experiments essential - the results of duplicate experiments cannot be exactly predicted. Most repetition of experiments is essential for reliability of results - it is not needless duplication.

These two factors combine to make extremely difficult, in most cases at present actually impossible, the task of modelling any one kind of animal either through the use of some other, usually "lower," kind, or by some type of mathematical, computer-based model. There are only a few situations known in which it is possible, with any degree of accuracy and reliability, to model some specific feature of a particular animal in either of these two ways. The present state of knowledge is hopelessly inadequate to generally permit such modelling.

If it were possible to use microorganisms or tissue cultures instead of whole animals in certain experiments, the switch would quickly be made. It is much cheaper and easier to carry out experiments in a small dish than it is to deal with a rat colony. Some things are also simply physically impossible: one cannot induce lung tumors in bacteria.

2) HR 556 implies the establishment of a whole new bureaucracy and set of rules and regulations - to do things already adequately being done by existing laws and agencies. It is unenforceable without such a bureaucracy.

The avowed policy of the Reagan Administration is to remove the Government from the back of American industry by doing away with unnecessary regulations. HR 556 promises to inflict upon scientific research a comparable yoke of well-intentioned but wasteful guidelines. If the Act is passed millions of currently well-directed research dollars will be converted to useless, theoretical research based on simulated data fed into computers. Enough people have already been killed and maimed by poorly tested drugs (e.g. thalidomide) and enough people are suffering the ill effects of the Love Canal and Agent Orange follies. There is no theoretical method or electronic device, currently available or in development, that will take the place of data supplied by live animal experiments. The hard fact is that we will either use animals in our experiments or we will inadvertently be using humans. It is about as practical to study biology without animals as it is to have a navy without water.

3) The budgetary impact of HR 556 would substantially destroy the effectiveness and efficiency of most of the country's present program of biomedical, agricultural and basic zoological research.

The ASIH would support a well thought out bill directed toward promoting an orderly program of development of scientifically realistic methods for reducing needs for the experimental uses of animals, funded at a level which would not jeapordize essential existing programs. It would also support educational efforts to speed up the application of such technology. HR 556 is not such a bill. It should be defeated.

Statement submitted on behalf of ASIH by
Dr. Malcolm S. Gordon, Chair
ASIH Committee on Public Affairs

October 8, 1981

Dr. Malcolm S. Gordon
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Los Angeles, CA 90024

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TESTIMONY OF

JOHN F. KULLBERG,
EXECUTIVE DIRECTOR,

THE AMERICAN SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS

THE TREATMENT OF LABORATORY ANIMALS AND ALTERNATIVES TO THEIR USE

Throughout the country, in institutions ironically devoted to the advancement of science, backward steps are taking place through the use of more and more animals in often unnecessary, duplicative and unreliable testing procedures. This is a critical humane issue, heightened by our belief that the way a society treats its animals reflects the degree of respect that society has for all life. Since the United States government is one of the largest users of laboratory animals for scientific testing purposes, it is imperative that it set a humane example by assisting in the development of alternate testing methods.

FEDERAL GOVERNMENT ROLE IN SAFETY TESTING: The Federal Hazardous Substances Act, Toxic Substances Control Act, National Environmental Protection Act, Occupational Safety and Health Act, and Federal Food, Drug, and Cosmetic Act all require safety testing. For example, one federal agency, The Food and Drug Administration, requires that either each ingredient used in a cosmetic product and each finished cosmetic product "be adequately substantiated for safety prior to marketing" or that the lack of such safety precautions be noted on the product. The latter choice is clearly a risky economic alternative that most producers avoid.

THE DRAIZE TEST: One of the most common tests used by cosmetic firms to fulfill safety mandates is the Draize Opthalmic Irritancy Test. In this test chemicals of varying caustic content are forcefully dripped into rabbits' eyes for periods of up to three weeks. Since this species is without tear ducts to wash away foreign matter, these rabbits suffer from the pain that results from the lesions and irritancies that develop. This particular procedure has been in use for over forty years without change, even though much evidence exists that challenges the reliability of such tests.

THE LD/50 TEST: LD/50 ("Lethal Dose 50%) is another experiment commonly used to test substance toxicity. Standard administration of this test calls for an animal to be force-fed large quantities of the substance in question. Close watch is kept on the subject for its reaction to these massive doses: gasping, salivation, loss of appetite, vomiting and excessive defecation surprise no scientific observer. And when death has been induced in fifty percent of the animal subjects, the lethal dose is noted. Many questions exist as to the reliability and necessity of this test.

MUST SO MANY ANIMALS BE USED? A great number of animal experiments are unnecessary and scientifically unreliable. They often merely duplicate other experiments which have preceded them. For instance, in the United States over 100 new cosmetics products flood the market each week. Although their ingredients are often identical to those in other preparations, redundant animal tests continue to take place.

CARE FOR LABORATORY ANIMALS: In addition to questions of the necessity for and reliability of many tests involving animals, we are also concerned with the conditions under which laboratory animals are kept. Expedience and economics too often take precedence over humane considerations. Proper feeding, exercise, and medical treatment should always be of primary concern, but under today's regulations, there are no guarantees. The ready availability of research animals inhibits the progress in reducing animal use and improving the care taken of those that must be used. The availability of animals at a cheap rate for experimentation encourages careless handling and waste of life.

ECONOMIC QUESTION: Research monies are continually targeted to the acquisition of more and more animals. We urge the Congress to investigate whether, apart from important humane considerations, the increasing use of animals is cost effective in the long run or whether non-animal alternate methods might be more practical and cost effective. A Canadian cancer researcher who replaced animal tests in one procedure with human cells cut testing costs and time from $150,000 and three years to $260 and one week.(1)

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(1)Curtis, Patricia, "New Debate Over Experimenting With Animals," The New York Times Magazine, December 31, 1978.

CAN WE RELY ON ANIMAL EXPERIMENTS? More and more scientists are questioning whether animals' body systems resemble humans' closely enough for test results to be valid. Pharmacology textbooks cite endless examples of drugs that were declared safe on animals, only to prove dangerous on people. Thalidomide, for example, failed to produce deformities in the offspring of mice, rats, hamsters, chickens, cats, dogs and monkeys. Penicillin kills guinea pigs and causes cancer in rats. Aspirin, insulin, and cortisone cause birth defects in mice. In addition to the demonstrated inaccuracy of these tests, they are also incapable of pointing out harmful long-term effects of new substances, simply because the lifespans of small animals are far shorter than those of human beings. Massive doses through force-feeding, inhalation or other means in a short term may not be an effective, reliable method of gauging long-range effects.

ALTERNATIVES: One new test which has already demonstrated its viability was developed by Berkeley biochemist Dr. Bruce Ames. To determine the carcinogenic properties of chemicals, the Ames test substituted salmonella bacteria for animals, with great effectiveness. It was this test which revealed the carcinogenic dangers of hair dyes.

Computers also show significant potential for performing complex experiments and formulating analyses without the use of animals. They have been used to create and simulate models of living systems without destroying those systems.

Tissue cultures, either extracted humanely or created in laboratory test tubes, are also proving to be feasible methods of testing for chemical reactions and in nutritional and genetic studies. Plants and lower organisms are also cheap, available, and viable substitutes for animals in some experiments.

Funded by a $12,500 grant from the American Fund for Alternatives to Animal Research is a test still under development by Dr. William Fleck of Whitman College in Walla Walla, Washington. This test calls for one-celled organisms called tetrahymena to screen substances for teratogens (agents that cause birth defects). It is expected that Dr. Fleck's test, if and when perfected, will be cheaper, quicker, and more accurate than putting thousands of pregnant animals to death.

Organ banks are another source for alternative testing. For instance, preserved human corneas might spare countless white rabbits from undergoing the horrors of the typically unreliable Draize test.

NEED FOR LEGISLATION: Regrettably, some forms of animal testing will persist until alternate procedures are perfected, popularized, and accepted as standard within the scientific community. Until then, we see a strong need for legislation which will require laboratories to treat their test animals humanely, avoid unnecessary and duplicative experimentation, and provide post-experiment care to minimize discomfort and disability.

THE HISTORIC ROLE OF THE ANIMAL WELFARE ACT: In 1966, the first federal law aimed at protecting animals used for experimental purposes was enacted (The Animal Welfare Act P.L. 89-544). It has since been amended two times, in 1970 (P.L. 91-579) and in 1976 (P.L. 94-279) in order to better accomplish one of its initial intended goals, "to insure that animals intended for use in research facilities or for exhibition purposes or for use as pets are provided humane care and treatment" (Section 1(b)(1)). Five years have elapsed since the passage of the last amendment to the Animal Welfare Act and there has been sufficient opportunity to reflect upon the workings and the failings of the law.

In order to assure that the purposes of the Animal Welfare Act are accomplished, it is imperative that animals actually used for experimental purposes be afforded greater protection from unnecessary pain and suffering.

A. *DEFINITION OF ANIMAL:* One flaw in the existing Animal Welfare Act is its failure to specifically include in the definition of "Animal" (Section 2(g)) mice and rats, the animals most widely used for experimentation, and birds. As a result, no standards for the humane handling, care, treatment and transportation of such animals have been promulgated by the Secretary of Agriculture and, therefore, such animals are afforded no protection under the law.

B. *EXERCISE:* Also absent from the language of the Animal Welfare Act is the specific requirement that standards be promulgated by the Secretary of Agriculture to govern the normal exercise of animals used for experimentation. Unquestionably, exercise is a humane requirement for certain species, in particular dogs, cats and primates and the Secretary of Agriculture should, therefore, be specifically required to promulgate standards governing space for the normal exercise of animals.

C. *CARE BEFORE, DURING, AND AFTER EXPERIMENTATION:* Furthermore, the Animal Welfare Act does not, but should, contain provisions regarding the care of animals just prior to, during and subsequent to experimentation.

A provision such as that contained in H.R. 4406 prohibiting the use of a given animal in more than one operative procedure from which the animal is allowed to recover should be enacted. France and Germany have already enacted similar provisions in order to limit the pain and suffering that a given animal must endure.

D. *USE OF ANAESTHETICS AND EUTHANASIA:* Specific provisions relating to the use of anaesthetics and procedures that could cause the animal subject pain are needed.

The Animal Welfare Act should be amended to require the use of anaesthetics in experiments that could cause pain to the animal subjects and the euthanasia of animals who would be in pain after the wearing off of the anaesthesia; or at the very least if experiments likely to cause pain are permitted without the use of anaesthetics it should be only under specified conditions and there should be a requirement of greater accountability on the part of the individual performing such experiment and the research facility in which such experimentation is taking place.

STATUTES AFFECTING LABORATORY ANIMALS IN OTHER COUNTRIES: One need only look to the statutes comparable to the Animal Welfare Act in Great Britain (British Cruelty to Animals Act of 1876), France (French Decree Regulating Experiments on Animals of 1968) and Germany (Animal Protection Act of 1972) to see that a precedent exists for the revisions to the Animal Welfare Act suggested here and in recent legislative proposals.

In Germany, for example, prior to obtaining a permit to conduct experiments on vertebrate animals that could involve pain, suffering or harm to the animal, it must be demonstrated that the desired experimental results cannot be obtained by methods or procedures other than the animal experiment (section 8 (4), Animal Protection Act of 1972, Federal Republic of Germany).

These revisions to the Animal Welfare Act would have a minimal effect on the research scientist but could serve to more greatly prevent unnecessary pain and suffering to animals.

RECENT LEGISLATIVE PROPOSALS: A few bills have been introduced into Congress, most notably H.R. 4406, introduced by Congresswoman Schroeder and H.R. 556, introduced by Congressmen Roe, Hollenbeck and Richmond that seek to secure the more humane treatment of animals used for experimentation and research and to encourage alternate means of testing, respectively. The enactment into law of many of the provisions in these bills is essential if the important goals of the Animal Welfare Act are to be realized.

MANY EXISTING FEDERAL REGULATIONS ENCOURAGE ANIMAL EXPERIMENTATION: Some acts with regulations that encourage the use of animals for testing purposes were noted at the beginning of this testimony. Agencies that authorize and encourage such use include the Consumer Product Safety Commission (Title 16 Code of Federal Regulations, Part 1500) and the Environmental Protection Agency (Title 40 Code of Federal Regulations, Part 162). Federal regulations requiring the use of animals for experimentation should be changed to allow for the use of equally and more effective means of testing. It is also important for alternatives to the use of animals for experimental purposes be researched and a mechanism established so that those alternative methods of testing already existing may be disseminated to research scientists.

FEDERAL REGULATIONS CAN ENCOURAGE ALTERNATIVES TO ANIMAL EXPERIMENTS: A portion of federal funds earmarked for animal testing should be designated for research into the use of alternatives to such testing and for the dissemination to research scientists, in both the public and private sectors, of existing alternative methods of testing.

RESEARCH FACILITIES NEED AN ANIMAL COMMITTEE: We also strongly support a provision such as that in H.R. 4406 requiring the establishment of an Animal Care Committee in research facilities to review proposed projects involving the use of animals in a manner that could cause pain along with the requirement that a complete record of each matter considered by such Committee be maintained and be available for inspection.

CONCLUSION: Evidence presented during these hearings before your subcommittee, Mr. Chairman, will hopefully persuade you and other subcommittee members that humane standards must be raised in the vast experimental community, and that more alternatives to the unprecedented volume of sentient creatures now undergoing experimentation must be developed and disseminated. Only through the promulgation of humane regulation and other legislative assistance from the federal government, whose own role as experimentor is so great, will this next important milestone in our humane and cultural evolution be achievable.

STATEMENT

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

FOR THE RECORD OF HEARINGS

The American Veterinary Medical Association appreciates the opportunity to comment on one of the issues under consideration by the Subcommittee on Science, Research and Technology, the proposals to provide federal financial support for the development of alternatives for animal models in biomedical and biological research.

Laboratory animals have continuously played an essential role in biological and chemical research and safety testing. Many of the advances in human and animal health have been established only with the utilization of laboratory animals as a part of that research.

At this time, the American Veterinary Medical Association opposes H.R. 556, H.R. 220, and other legislation dealing with mandatory diversion of research funds to support a National Center for Alternative Research or other programs seeking alternatives to live-animal tests.

Biomedical scientists are already diligently and successfully seeking alternatives to live-animal tests. A reduction in funds available for research at this time would cripple the current efforts that are underway to develop less expensive and more effective methods to solve health problems as part of current research programs. The costs of obtaining and maintaining high-quality laboratory animals, as well as humane considerations, are among the motivations for this trend.

Inordinate diversion of funds would be inflationary and would reduce existing research support. There is increasing use of tissue culture in lieu of live animals to test drug and microbiological products and to produce vaccines and immunological products. The use of the modified bacterium, E. coli, to produce insulin instead of harvesting insulin from the pancreas of animals, and the production of the wonder substance, interferon, by microbes are specific examples of recent progress. Chemical synthesis of drugs, hormones, and biological products in the laboratory is commonplace today in lieu of production via animals. Thirty years ago all cortisone came from the harvested adrenal cortices of animals, whereas today the corticosteroids are derived by nonanimal synthesis. Establishment of a new federal agency intended to accomplish what is already being done would be counterproductive.

Consumer demand for greater safety when dealing with new drugs, chemicals, and biological agents has led to the required use of increased numbers of laboratory animals. Effective alternatives using lower forms of life are being utilized whenever possible. Continued development of new alternative safety testing methods and/or relaxation of some of the federal requirements for environmental protection and new drug approval will also have a positive impact on reduction in animal testing.

The American Veterinary Medical Association opposes further funding of alternative research, as such research is being accomplished with existing programs.

Statement

by

Edward Blotzer, Jr., President of
Animal Care and Welfare, Inc. S.P.C.A.

I welcome the opportunity to provide input to the Subcommittee on Science, Research and Technology as you reach a position on the use of life animals in medical research and laboratory testing.

My name is Edward Blotzer, Jr., and I am President of Animal Care and Welfare, Inc., S.P.C.A. of Pittsburgh, Pennsylvania. AC&W is a non-profit corporation chartered by the Commonwealth of Pennsylvania as a humane educational society with law enforcement authority. AC&W supports legislation to end unnecessary and inappropriate uses of animals in research and to develop alternatives to animal use.

In 1966 a federal Animal Welfare Act was passed. This Act concerns itself with certain categories of animals, including those used in laboratories. Although the Act set minimum guidelines for the housing and care of research animals, it has given the research community little incentive to improve upon the conditions of research animals, to seek alternatives to animal use, and to adequately justify the validity of experiments.

While I don't intend to rehash many of the important points which will undoubtedly be brought to your attention today, I would like to focus on three areas which are of great concern to the members of Animal Care and Welfare:

1. Self policing by laboratory animal care committees to ensure proper housing and care for research animals is not working. A good example is the recent Silver Spring IBR (Institute for Behaviorial Research) incident. At this laboratory, adequate veterinary care was not provided,

housing facilities were inadequate, and animal anti-cruelty laws were violated. If only one percent of all the U.S. research institutions carry on their programs in the same abusive manner, then we have some very serious problems. Since the public is denied the right to have access to or complete knowledge of what is happening in research laboratories, the situation could in fact be much worse.

2. Many animal experiments are pointless and bear no relevance to improving human life or eliminating disease. For example, Draize testing, which was developed 36 years ago, is used to determine the eye irritancy of substances. Drops of soap and perfume and other cosmetics are put into the eyes of rabbits to find out if these things are harmful to humans. The irritation levels are observed over several days, and then the animal is either used again for other testing programs or destroyed. Should innocent creatures suffer for human vanity? Other treatments to research animals include electric shocking (reward-punishment techniques), starvation, beatings, sexual manipulation, and poisoning, all under the guise of improving human ills. Where are the tangible results? After millions of taxpayer's dollars have been spent, after millions of unconsenting animals have suffered and died, and after centuries of research, there is very little concrete evidence showing improvement in human life or elimination of disease.

3. Medical research methods have virtually remained unchanged since the start of animal research. A great many experiments

being done today can be tracked back to a century or more ago: electric shockings, burnings, poisoning of animals to death in order to test drugs and chemicals. Is is unconscionable that the research community has not replaced its outworn, obsolete animal using tests with modern research methods of computers, tissue cultures, mechanical models.

We urge the Subcommittee to take immediate action to develop alternatives to animal research, to reduce the number of animals used in laboratories (where alternatives do not yet exist), to eliminate or minimize the repetition of experiments, and to set up independent animal care committees to police laboratories.

Hopefully, with the commitment and energy heretofore expressed by concerned citizens and members of Congress, we will take a giant step forward to end inappropriate uses of animals in research and to encourage alternatives to animal testing.

Animal Defense Council
2340 East 8th Street No. 5 • Tucson, Arizona 85719 • (602) 623-1867

10/12/81

Honorable Doug Walgren, Chairman
Subcommittee on Science, Research
and Technology of the Committee
on Science and Technology
House Office Building
Washington, D.C. 20515

Dear Representative Walgren:

Mr. Chairman, members of the committee, thank you for affording us the opportunity to enter into the record our written comments on H.R. 556, the Research Modernization Act.

It is estimated that each year 100 million animals are the subject of laboratory experiments. Numerous articles appearing in research journals describe how many of these experiments are performed without providing anesthesia to the animal subjects. Some of these experiments include the electric shocking and poisoning to death with commericial products such as weed killers and kerosene.

Currently there are many viable alternative methods of research which can be used to reduce the suffering of animals, or to eliminate them completely from certain experiments. Some of these alternatives include: mechanical models, computer models, chemical assays and anthropomorphic dummies.

The Bill that is before you, H.R. 556, promotes the continuing discovery and use of non-animal methods of research when these methods are feasible and equal to the use of animals.

The Research Modernization Act, H.R. 556, would provide for the establishment of a national center that would study non-animal methods of research and train scientists in the use of these methods.

The Bill would also eliminate the duplication of some experiments that use laboratory animals. In addition to reducing the suffering of animals this provision would save taxpayers millions of dollars.

We strongly urge you to support H.R. 556, the Research Modernization Act. We also urge you to make no changes in the Bill that would weaken it.

Sincerely,

Carmine F. Cardamone

Carmine F. Cardamone
Director

ADIRONDACK COUNSELING
GLENWOOD ESTATES
SARANAC LAKE, N.Y. 12983

TELEPHONE (518) 891-4140

DR. EMMANUEL BERNSTEIN, PSYCHOLOGIST

10/5/81

Chairman Doug Walgren
Subcommittee on Science, Research, and Technology
2319 Rayburn House Office Building
Washington, D.C. 20515

TESTIMONY FOR THE RESEARCH MODERNIZATION ACT

I firmly believe that the bill to encourage alternatives to animal experimentation is most worthwhile. Passage would lead toward considerable economy with more productiveness: new directions and discoveries which should generate more meaningful new knowledge.

There is not only much unnecessarily repetitive research with animals in progress, but also misleading research as well as irrelavent research in that it is inapplicable in any practical way for humans or animals. This past year I studied dozens of articles concerning what we know about child abuse, and how we can deal with it to improve conditions for children. Only one reference in fifty pertained to animal research. From this I surmise that the experts agree that 98% of our useful knowledge in this area has come from attention to human children and their situations rather than from animal research. I began to research several other areas of childhood and had begun to find the same: animal experiments were rarely, if ever, mentioned in any given article or publication. Does this not suggest that research funds would be more valuable if directed toward other-than-animal experiments?

Among the alternatives that could deliver exciting new directions and useful knowledge: 1) New ways of pooling already known knowlege and combining it through clever computer programming and use of the entire Library of Congress 2) Study of succesful pilot programs (regarding abused children, for example) with long-term follow-ups that took into account many social/human variables 3) Use of self-reports in innovative ways 4) Innovative use of autopsies (for example combining it with past data on the patient including self-reports): more intensively studied 5) More emphasis on the study of healthy persons and why they remain healthy.

Experiments that *simulate* real human problems and situations are far removed from reality. For example when testing the U.S. Astronauts under artificial simulated flights there were severe problems of stress that never occured (much to their surprise) in the real situation in outer-space... With the use of an animal, experiments tend to become at least thrice removed from reality 1) Animals think and react differently than humans 2) The artificial *situation* further removes the research from reality 3) Use of unnatural surroundings and an environment alien to its species further removes the research from reality... Behavioral research that has been most beneficial, most useful and applicable have come from studying humans in real situations.

I believe that experiments which treated animals as if they were emotionless objects has often led to the treatment of humans as objects. In healing, compassion is always the major ingredient. Animal experiments cannot deal with compassion... Humans and animals do not react as objects unless they are de-humanized or de-animalized: and even then only under extreme and artificial conditions.

I believe the bill would open the door for discoveries of valuable new dimensions in research where scientists are likely to find a whole new world of realities - research that will be unusually productive and meaningful.

EM Bernstein

Emmanuel Bernstein, Ph.D.

N.Y. State Licensed Psychologist

Member of American Psychological Association

Co-coordinator of Psychologists for the
Ethical Treatment of Animals

CHARLOTTE PARKS
Chairman
York ME 03909

FRANCES HOLWAY
Legislative Chairman

K. T. HAGAN
Secretary

COMMITTEE FOR CONSTRUCTIVE LABORATORY ANIMAL LEGISLATION

Statement of Charlotte Parks in Support of

H.R. 556

For the Record of the Public Hearings on the Use of Animals in Medical Research and Testing. Before the Subcommittee on Science, Research and Technology. The Committee on Science and Technology. United States House of Representatives.

Mr. Chairman, the Honorable Doug Walgren, and members of the Committee:

I am most gratified that you are investigating the use of live animals and of alternative methods in medical research and testing, and I would ask that this statement of mine and enclosures be included in the Record of the Hearings which you are conducting.

The subject of "alternatives" is one in which I have been deeply involved since 1959 - with the publication of Russell and Burch's The Principles of Humane Experimental Techniques. I recall the first bills introduced into Congress for the protection of laboratory animals, in 1961, and the Hearings on them in 1962. I was chairman of the Committee for Constructive Laboratory Animal Legislation, and we introduced several bills. None of these early bills were enacted, but it is pertinent to note that they contained provisions for the use of "alternatives".

Since that time the value of alternatives is more widely recognized, scientifically, economically and ethically, but progress in their utilization has not been in keeping with their many advantages. I believe the chief reasons for this lag have been:

(1) Our lack of facilities and funds for research and development of alternatives;

(2) Our lack of training programs for investigators in these modern techniques;

(3) The fact that fundamental advances in science and technology occur so rapidly that it is difficult for the researcher to keep abreast of new developments and their implications for his own field; and

(4) The further fact that the educational system is such that scientists in one field are not equipped with the basic knowledge to appreciate the full potential of advances in other fields.

Obviously the job of organizing and coordinating all this, and the dissemination of the knowledge and training of scientists in alternative methodology, and the funding as well, must be the responsibility of the Federal government. In this connection it is pertinent to note that in Canada a prestigious group of toxicologists in a recently completed study of the potential of alternatives, recommended that "governmental departments and agencies ... initiate and fund programs with the specific objective of developing and validating non-animal models" (Report of a Workshop on Alternatives to the Use of Laboratory Animals, enclosed).

H.R. 556 recognizes the government's responsibility here, and provides for a National Center for Alternative Research within the National Institutes of Health, composed of a representative from each Federal agency conducting or sponsoring research and testing, with each such agency directing 30% to 50% of its research funds towards alternative methods. This would speed the development and utilization of this modern methodology, with scientific, economic and ethical advantages.

H.R. 556 would also provide solutions to two serious problems, one of which is the present method of grant-awarding by which proposals involving the use of animals are reviewed by scientists in the same discipline -- thus perpetuating the old animal-using methods. H.R. 556's Advisory Committee should help solve this problem.

The other problem is that of difficulty of retrieval of information concerning research already done. Retrieval is presently so difficult that experiments are repeated and duplicated at tremendous waste of animal life and suffering as well as of researchers' energies and time, and of research funds. H.R. 556 would correct this.

I submit that the old empirical method of " trying it on the dog" (or on the slave) does not meet the criteria of an otherwise innovative society. I strongly support H.R. 556 because I am convinced that its provisions would be of inestimable benefit to all concerned: man, science and animals.

Charlotte Parks

Enclosures:
Report of a Workshop on Alternatives (CSPCA)
Alternatives to Laboratory Animals (FRAME)
"Taking Our Medicine" by Robert Sharpe M.D.
Newsletter of Council for Laboratory Animals, March 1981
(Under separate cover) Alternatives to Pain in Experiments on Animals by Dallas Pratt M.D.

STATEMENT OF THE

COSMETIC, TOILETRY AND FRAGRANCE ASSOCIATION

Cosmetic, Toiletry and Fragrance Association
Statement to Congress on Animal Testing Hearings
October 13-14, 1981

The Cosmetic, Toiletry and Fragrance Association (CTFA), founded in 1894, is the national trade association representing the cosmetic, toiletry, and fragrance industry. 1/

Cosmetic manufacturers are under a legal obligation to manufacture safe products. The Federal Food, Drug, and Cosmetic Act, enforced by the U.S. Food and Drug Administration (FDA), provides that a cosmetic is "adulterated" if it contains "any poisonous or deleterious substance which may render it injurious to users ... under such conditions of use as are customary or usual." 2/ FDA regulations specifically require that each ingredient used in a cosmetic product and each finished product be adequately substantiated for safety prior to marketing. 3/

The Act also provides that a cosmetic is "misbranded" if its labeling is false or misleading, or if required information is not prominently displayed on the label. 4/ A cosmetic product that has not been adequately substantiated for safety must carry a prominent label warning on its front panel stating that fact, 5/ or it is considered by regulatory officials to be misbranded.

To assure safe and suitable products and to avoid adulteration and misbranding charges, cosmetic manufacturers routinely evaluate ingredients and finished products. At the present time, testing techniques utilizing whole animals often may be the only available means to determine safety of certain products. Such techniques are often the only safety substantiation method accepted by the government and the scientific community.

FDA has stated, "The use of animal tests is generally recognized and accepted by regulatory agencies as the principal basis for assessing potential risks from exposure to chemicals ... This basis has been universally recognized and accepted by the courts." 6/

1/ CTFA has an active membership of more than 250 companies that manufacture or distribute approximately 90 percent of the finished cosmetic products marketed in the United States. In addition, CTFA includes more than 220 associate member companies from related industries, such as manufacturers of cosmetic raw materials and packaging materials.

2/ 21 U.S.C. §361(a).

3/ 21 C.F.R. §740.10.

4/ 21 U.S.C. §362.

5/ 21 C.F.R. §740.10.

6/ 44 Fed. Reg. 17085 (March 20, 1979).

In certain cases, FDA, by regulation, explicitly requires the cosmetic industry to undertake safety testing using animals. For example, FDA regulations issued in 1977 7/ prescribe that color additives used in cosmetic products undergo testing using animals, to reaffirm the safety of the colors for use in cosmetics.

Similarly, in a formal advisory opinion, FDA has said that "[r]easonable approaches" and "appropriate testing procedures" to assure that a cosmetic is "adequately substantiated for safety" are set forth in certain scientific journal articles that specifically prescribe the use of various animal safety tests. 8/

An example of safety testing by the cosmetic industry and other industries involves the Draize eye irritation test, which uses rabbits to evaluate potential eye irritancy of many consumer products including cosmetics. The Draize eye irritation test was developed and published in 1944 by Dr. John Draize, a pharmacologist for the FDA. The test is recognized by the scientific community as the accepted standard for determining eye irritancy of various ingredients and finished products. Cosmetic manufacturers use the test to assure safety of products that may be introduced accidentally into the human eye. In an official May 1980 "Talk Paper" (copy attached), the FDA said that "the Draize test is the most reliable method to predict the harmfulness, or safety, of a substance that may enter the human eye. The test is needed to assure that ingredients that may come into contact with the human eye will not be harmful -- or that appropriate labeling warns of a hazard." 9/

In addition to FDA, other government agencies have recognized the need for eye irritancy testing for safety purposes. The Consumer Product Safety Commission (CPSC) includes the test in its regulations as the appropriate test to be used in determining whether products are eye irritants. 10/ The Interagency Regulatory Liaison Group (IRLG), a group of federal government agencies concerned with the public health and safety (FDA, CPSC, the Environmental Protection Agency, the Occupational Safety and Health Administration, and the Food Safety and Quality Service of the Department of Agriculture) has recommended in guidelines that various animal testing approaches including eye irritancy testing be used for safety testing. 11/ Finally, pesticide regulations of the Environmental Protection Agency (EPA) provide for eye irritancy testing in animals in order to determine appropriate precautionary statements to appear on product containers. 12/

7/ 42 Fed. Reg. 6992 (February 4, 1977).

8/ 40 Fed. Reg. 8916 (March 3, 1975).

9/ FDA Talk Paper T80-30, May 30, 1980, The Draize Test

10/ 16 C.F.R. §1500.42.

11/ IRLG Guidelines, January 1981: Acute Oral Toxicity in Rodents; Acute Dermal Toxicity Test; Teratogenicity Studies in the Rat, Mouse, Hamster or Rabbit; and Acute Eye Irritation Testing.

12/ 40 C.F.R. §162.10(h).

CIFA and its members are concerned that animals used in testing be treated humanely. Indeed, animals used for safety testing are treated humanely and with respect, in accordance with the Laboratory Animal Welfare Act 13/ and regulations of the U.S. Department of Agriculture. 14/ The regulations prescribe requirements for temperatures, enclosures, feeding, veterinary care, and handling of laboratory animals to ensure that they do not needlessly suffer either physical or emotional trauma.

Furthermore, the cosmetic industry has undertaken broad efforts to find non-animal alternatives to animal safety tests, in order to reduce to the irreducible minimum the number of animals needed for such testing. Cosmetic companies are concerned that animals not be used in testing where there are accepted and validated non-animal alternatives. Despite the clear government mandate that animals now be used in safety testing, our member companies are hopeful that non-animal tests can be developed over the next several years to help replace animal tests.

To that end, CIFA has established a Research Center for Animal Testing Alternatives at the Johns Hopkins University in Baltimore, Maryland, to encourage research in the development of non-animal, or *in vitro*, test procedures for evaluation of the toxicity of chemical compositions, to develop and validate methodologies that will provide alternative approaches to whole animal studies for the evaluation of safety, to disseminate information about research progress through publications and workshops, and to promote government acceptance of useful methods of non-animal safety testing. CIFA is the initial contributor, and has pledged one million dollars for the first three years of research. Johns Hopkins will solicit additional funds for the Center from other affected groups, including government, private foundations and institutes, industry groups, and animal welfare leagues.

CIFA will not direct the Johns Hopkins Center, but will receive regular information on the Center's progress and will submit comments as appropriate.

CIFA believes this program is a laudatory effort by the cosmetic industry to be responsive to important public concerns, while still recognizing industry's primary responsibility to market only those products that have been proved safe through the most up-to-date, accepted testing methods.

13/ 7 U.S.C. §2131.

14/ 9 C.F.R. Part 3.

FASEB FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY
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Member Societies
AMERICAN PHYSIOLOGICAL SOCIETY
AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS
AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS
AMERICAN ASSOCIATION OF PATHOLOGISTS
AMERICAN INSTITUTE OF NUTRITION
AMERICAN ASSOCIATION OF IMMUNOLOGISTS

ROBERT W. KRAUSS
Executive Director

JOHN R. RICE, C.P.A.
Comptroller

October 13, 1981

The Honorable Doug Walgren, Chairman
House Committee on Science and Technology
Subcommittee on Science, Research and Technology
2319 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman,

The Federation of American Societies for Experimental Biology is pleased to accept your invitation to contribute to the discussion which began October 13 and 14 in the hearings of your Subcommittee on the use of animals in biomedical research and testing. We join others in the scientific community in thanking the Subcommittee for providing a forum in which conflicting judgments on values and priorities affecting the future of biomedical research can be aired publicly.

The six learned Societies comprising the Federation represent basic research disciplines in the biological and medical sciences. They have an aggregate membership of 22,000 M.D. and Ph.D. research scientists. This statement has been endorsed by the Public and Scientific Affairs Board of the American Society for Microbiology, which has a membership of 35,000, including more than 15,000 M.D. and Ph.D. scientists.

The public has made an enormous investment in biomedical research and holds high hopes for its outcomes. Those of us who are entrusted with these funds assume an obligation to explain and defend what we do and to provide an accounting for our stewardship. We also assume a responsibility to provide our best professional judgment on what needs to be done.

The way we treat animals and other living things is one measure of our claim to humanity. Perhaps a better validation of our claim is the way we develop and use new knowledge to improve the lot of both animals and man. Outside of man himself, the animal has been and will continue to be the best single key to the biological functioning of man, notwithstanding the onrushing development and increasing sophistication of a variety of aids, such as computer and mathematical models and the use of cell and tissue cultures.

Active opposition to the use of animals in research has been a recurring phenomenon of varying intensity. Individuals and groups with deeply held convictions and a forceful way of expressing them have periodically mounted major efforts to eliminate, through law, the use of animals for research purposes. On each occasion

Congress has come down on the opposite side of the issue, opting for what it has seen as the higher good for both animals and man. Congress may again have to face that decision on behalf of the American people.

All of us hate war. But we recognize there are times when war is necessary if our way of life and system of values are to survive. In a civilized society we also recognize that not all will see war as necessary, but rather as something to be avoided at all costs. So, our society respects and accords special status to the conscientious objector. In the war on disease there are also conscientious objectors. We respect their feelings and their right to express them, and we would not deny them the common fruits of victory over disease. But we would not put them in command of the troops on whom victory depends. Unfortunately, that would appear to be the practical effect, if not intent, of H.R. 556, the "Research Modernization Act."

Those who have fought long and tirelessly but unsuccessfully to eliminate the use of animals in research apparently feel that the next best thing to outlawing the use of animals is to tie up the agencies and the scientific community in so many administrative and operational knots that animals will be available only to those researchers who have the time, endurance and stomach to fight the system. H.R. 556 is a textbook illustration of an administrative quagmire. It is a textbook case on how to create havoc in a productive enterprise by forcing the reallocation of a major portion of its resources from successful ongoing programs to programs and purposes where inadequacies of the science base and available technology preclude effective use of those resources. H.R. 556 also takes the unprecedented steps of prescribing how science will be done and redirecting the traditional ways in which scientists communicate with each other.

The public appeal of the Research Modernization Act derives from the illusion that the day has arrived when all we have to do is push buttons on a computer and we will find out all we need to know. That day is far off, and it can be doubted that it will ever come. The illusion is sustained by an uncorrected misconstruction of the word ALTERNATIVE, when referring to alternative methods of research. These so-called alternative methods--computer simulation, mathematical models, use of cell and tissue culture, etc.,--are, in fact, aids, adjuncts, supplements or short cuts which help an investigator to decide whether an experiment on an animal is likely to produce a useful result. These adjuncts provide no absolutes. They cannot replace animals or humans in biomedical research and it would be unforgivable to represent that they can. They are useful in early feasibility studies and can help a scientist to determine whether he or she is headed in the right direction, but their uses are restricted by the limits of the technologies involved. Alternative methods of research can and do help to reduce the number of animals required for research, but there is no way they can eliminate the need for animals in research and testing preliminary to testing in man.

The thing to be regretted most about this exercise is that it was not necessary. The stated purposes and goals of the proposed legislation have been and are being actively pursued by scientists in the day-to-day conduct of their work, without prodding through legislation. The Institute of Laboratory Animal Resources reports that animal usage dropped 40 percent in the last ten years. Animal research and testing is time-consuming and costly. Scientists are in a continuing search for new methodologies as a matter of good science and as a matter of economics. Progress toward the stated goals of the legislation will be much more rapid if scientists are not obliged to negotiate the hurdles represented by H.R. 556.

At the beginning of my statement I said that the way we treat animals and other living things is one measure of our claim to humanity. It is out of keeping with the spirit and purpose of the biomedical research profession for a scientist to abuse, neglect or inflict unnecessary pain on an animal in his care or permit anyone else to do so. No one need be in the dark about what is expected. Each of the granting agencies has detailed guidelines for the care and use of laboratory animals. Scientists do not by definition walk on the water. They are human and there will be those who, either from defect of instinct or indifference to social and professional values, betray the spirit of their profession and the public trust. The scientist who finds himself in this category should be prepared to live with the censure of his peers and whatever penalties society sees fit to inflict. But he or she should be dealt with as an individual aberration. We do not eliminate the police force because a cop is found to be on the take. And we do not eliminate legislatures because an individual legislator departs from grace.

While Congress can legislate neither the dynamics of science nor human kindness, it can do much to encourage both. It can provide additional resources (as proposed in H.R. 220) to further the development of alternative scientific methodologies leading to further reductions in the use of animals in research. And Congress can establish a Commission (as proposed in H.R. 930) to study alternative research methodologies. Congress also can provide additional resources to those agencies responsible for monitoring compliance with regulations and guidelines relating to the care and use of laboratory animals.

In conclusion, Mr. Chairman, we would like to thank you for opening up channels of communications between the animal welfare organizations and the scientific community. Perhaps in the future we will find ourselves talking to each other rather than past each other. In any event, we thank the animal welfare organizations for their role in forcing us to renew our focus on values none of us should take for granted.

Sincerely,

Earl Wood

Earl H. Wood, M.D., Ph.D.
President

cc: The Honorable Henry A. Waxman
Chairman, House Subcommittee
on Health and the Environment

STATEMENT OF DR. MICHAEL W. FOX
SCIENTIFIC DIRECTOR

THE HUMANE SOCIETY OF THE UNITED STATES

INTRODUCTION

The effects of captivity on the behavior of wild animals, especially primates, and the stress effects of cage-rearing and social/environmental deprivation or crowding on laboratory animals is a complex problem. It concerns veterinarians in whose care and jurisdiction lies the health and well-being of laboratory animals and the scientist whose research may be adversely affected by such influences. Concerns over the physical environment, such as optimal lighting, ventilation and cage size, were, until recently, addressed only in relation to laboratory animal health and disease control. Now the behavioral and psychological requirements and overall well-being of laboratory animals need to be addressed for two reasons. First, we have ethical responsibilities towards the animals (that is animals whose physiological and psychological states are not known and those behavioral requirements are frustrated or denied) will mean poor research (and conceivably poor medical applications), (Festing, 1977).

Experiences early in life - (social and environmental) may influence development and later behavior, physiology and disease resistance in all the animal species commonly used in research (Fox, 1970). The consequences of domestication (and by analogy, 'laboratorification') over several generations are no less profound and must also be understood (Fox, 1978), otherwise the behavioral phenotype of the animal remains an 'unknown', and as such, constitutes an uncontrolled experimental variable.

This report details many influences of the laboratory environment on animal behavior, physiology and responses to induced diseases, drug tests and the like. Even routine laboratory procedures may affect the animal adversely in relation to a given experiment and if not identified and controlled, could either invalidate the findings or lead to erroneous inferences. It will be demonstrated that the humane treatment of laboratory animals, including adequate provision for their basic behavioral, social and emotional needs, is an essential prerequisite for quality research, thus proving, on the basis of sound scientific documentation, the practical benefits to biomedical research of treating laboratory animals humanely and in meeting their behavioral requirements through good husbandry practices

Modern innovations with sensors, biotelemetry and automatic behavioral recording devices have direct application to the field of laboratory animal care, together with the techniques of objective behavioral analysis afforded by advances in ethology. Lehner (1979) states:

> While it is true that there is a dearth of studies on animals, such a scarcity may not be due entirely to scientists' "Cartesian mechanistic view". It should be emphasized that among the lay public there has been a developing attitude (which manifests itself in some political views) that any research that will not directly aid mankind should not be funded. Researchers applying for grants - to study drinking behavior in rats, or preference in nesting materials, etc., have been turned down for more "relevant" research such as cures for cancer. Thus, a re-education of the public as well as some scientists is necessary to emphasize the importance of studying animals so that better use can be made of them, and their general care enhanced through a better understanding of their basic needs, an understanding which will not be forthcoming if the essential and much needed ethological research is not funded or encouraged.

The relevance of ethology to laboratory animal care will be shown in this report. For too long, the behavioral-psychological aspects of animal care have been neglected and it is hoped that these hearings will stimulate not only interest and concern, but also improvements in husbandry practices and more applied research to improve the care and quality of animals used in biomedical research. This will help reduce the numbers needed and, therefore, costs, as well as enhance the validity of research findings derived from them.

CAGE SIZES AND CONFINEMENT

A brief survey of recommended cage sizes for various laboratory species (see Table 1) reveals a subjective cultural difference in standards, rather than differences based on sound scientific rationales. The striking doubling of recommended cage size for cats, dogs, and primates in England over the dimensions suggested by American authorities would logically seem to imply the English and American animals are in some way different. From what we know of such animals though, such an interpretation is illogical. This therefore leads one to the obvious conclusion that the entire process whereby cage size requirements are determined is illogical and unscientific.

A rigorous reassessment of cage sizes recommended for the various laboratory species is needed on both humane and scientific grounds. An arboreal or active terrestrial animal should have room in which to swing, leap, or run, and satisfy its basic behavioral requirements. In the absence of adequate freedom, this activity drive may be discharged in abnormal motor patterns, including rocking, pacing, weaving and whirling in carnivores (Fox, 1965; Thompson, Heron, 1954) and primates (Berkson 1967; Berkson et al, 1963, 1968). Abnormal compulsory regimes may develop even in rodents (Kavanau, 1964) and birds (Keiper, 1969) as a maladaptation to confinement. Such behavior patterns tend to develop their own autonomy (Morris, 1966) like an obsessive-compulsive neurosis, and can lead to physical deterioration and even self-mutilation (Meyer and Holzapfel, 1968; Tinklepaugh, 1928).

TABLE I - TABLE 1 - CAGE SIZE RECOMMENDATIONS

	Agencies		
SPECIES	USDA	NIH	UKHO
Mice	-	15 sq.in.	10 sq.in.
Rats	-	29 sq.in.	40 sq.in.
Guinea Pigs	60 sq.in.	60 sq.in.	73 sq.in.
Rabbits	3 sq.ft.	3 sq. ft.	6 sq. ft.
Cats	2½-3 sq.ft.	2½-3 sq.ft.	5½ sq.ft.
Dogs (medium size)	12 sq.ft. (according to body length)	12 sq.ft.	20 sq.ft. plus 28 sq. ft. open air run)
Monkeys (medium size)	-	4.3 sq.ft. (2½ ft. high cage)	7 sq.ft. (4 ft. high cage)

U.S.D.A. UNITED STATES DEPARTMENT OF ARGICULTURE

N.I.H. NATIONAL INSTITUTES OF HEALTH

U.K.H.O. UNITED KINGDOM HOME OFFICE

Some animals in small cages, especially dogs and monkeys, cannot satisfy their normal elimination behavior patterns and are forced to defecate and urinate where they live and sleep. This is quite contrary to their nature and a two-compartment cage (or cage with run) is the humane option.

A wide range of behavioral abnormalities and changes in temperament and emotionality have been described in primates and other laboratory animals and attributed to cage confinement (Fox, 1965; Krushinski, 1962; Mitchell, 1970; Sackett, 1968; Thompson, 1967). Cage confinement may not only increase abnormal stereotypic behaviors, it may also cause increased timidity (Krushinski, 1962). This in turn may lead to fearfulness and defensive-aggressive reactions when being handled, making routine handling and restraint difficult and sometimes dangerous for both personnel and for the animals. Increased aggression in confinement and in a crowded animal facility may be a pathological 'hypertrophy' of the normal territorial defensive behavior, again making the animal extremely difficult to handle.

More extreme confinement, limiting physical activity for extended periods (in constraining chairs, slings and stocks) produces gastric ulceration in a number of species (Ackerman, et al, 1975; Ader and Plaut, 1968) or other stress reactions which may be detrimental to a given experiment if not controlled for.

Cage size has been demonstrated conclusively to be an important factor in environmental enrichment for rodents (Manosevitz and Pryor, 1975). This study by psychologists using refined behavioral measures contrasts a 'preliminary' study on the effects of cage size on physical activity in beagles (Neamand, et al, 1975). In the latter study, no significant differences were found. Investigators should be aware of the fact that unitary measures of behavior (such as activity) alone may be inadequate to evaluate a given environmental variable such as cage size. Multiple measures, including the frequency of occurrence of different behavior are often needed before significant differences can be demonstrated (Richter, 1971).

Many people claim that exercise is important for animals, but animals in nature that have fed, are warm, and are not afraid of predation or are not sexually frustrated, do not 'exercise'. Exercise _per se_ is an anthropomorphic concept, an unbiological activity at variance with the law of conservation of energy. Wild animals either play (either with each other, by themselves, or with appropriate inanimate objects), engage in grooming or other social activities or else they sleep. No drive to exercise has been recognized by ethologists.

The answer may be not to provide confined animals with exercise alone, such as a trendmill, but with varied stimulation. Dogs might be walked around the animal facility, leash trained, and exposed to objects, to strangers, and to a variety of audio-visual stimuli of varying intensity and complexity. This would be especially advantageous and appropriate where long-term experiments were to be conducted in which the subject would have to adapt to a new set of complex and novel stimuli.

Mather (1981) proposes that wheel-running activity of caged rodents is not related to boredom or the need for exercise, nor is it simply a reflection of general activity. Rather, such activity may reflect an urge by the caged animal to explore areas beyond the boundaries of its cage. Rodents may enjoy the opportunity to explore tunnels and ramps in 'play pens' containing various novel 'objects' and manipulandia. Primates could be provided with play objects, operant devices to 'work' in order to break the *taedium vitae* of a barren cage, and should have sufficient space to satisfy their locomotor activity needs, especially for brachiation.

Dramatic differences have been demonstrated in rats and mice raised in an "enriched" (i.e. relatively natural) environment compared to those raised under standard (but sub-optimal) cage conditions. Brain weight, cell density, cortical thickness, acetylcholinesterase and cholinesterase activity are affected, and "enriched" animals are generally healthier, more curious and have superior learning abilities (Ferchmin et al, 1975; Rosenzweig, 1971). These detailed studies would seem to imply that the "standard" laboratory cage environment may not produce an animal that is normal in any shape or form. What is needed to improve the quality of animals for research is greater attention to creating optimal environmental conditions.

SOCIAL CONTACT AND ISOLATION

Physical contact and social grooming in all animals results in a marked bradycardia or decrease in heart rate. This bradycardia is indicative of a high level of parasympathetic arousal (Fox, 1978) which may be a pleasurable, stress-relieving state of psychophysiological relaxation. It may be a significant motivating stimulus for social contact and lead to social dependence in 'contact' species. In other words, many species may rely upon being groomed by others to help maintain normal physiological homeostasis. Primates, for example, will groom more after there has been some conflict within the group, and this behavior may serve to relax or un-stress them.

Withdrawal of such stimulation would be stressful in more socially dependent species, in infant animals and in those rodent strains that are more gregarious than other strains. These observations lend serious doubt to the validity of certain experiments that use gregarious species, especially primates and rodents, that are kept in separate cages for convenience. The stress of sudden or continued social deprivation may have profound effects upon the animal's response to a given experimental procedure (e.g. radiation, induced cancer or other disease). The ethical issue of humane treatment, especially in those experiments involving long-term social isolation in primates, should also be considered.

One of the most frequently overlooked causes of phenotypic variability in a genotypically 'uniform' strain of animals is the interindividual variance created by dominance-subordination relationships: the 'peck' order of a social group that is raised and caged together. As social relationships change, so will the behavior and physiology of individuals affected by such changes.

Treatment of one animal may influence its social status and lead to a subsequent destabilization of the entire group. It is for these reasons that many animals are removed from their group for the duration of the study (or for their entire lives in some cases). Social isolation effects therefore are probably the most serious single class of uncontrolled variables in animal research and in gregarious, socially dependent species, which is a serious welfare question.

Particularly significant from the point of laboratory animal care and handling is the paradoxical effect of social deprivation. The animal may become hyper-aggressive and over-defensive of its territory and therefore difficult to handle; and when finally caught and restrained, its physiological state may contraindicate any anesthesia, drug assay or any baseline physiological or biochemical tests. Conversely, the human caretaker may come to be regarded as a surrogate or social companion substitute, even for rats (Sloan and Latané, 1974). Dogs and primates may become overexcited by the presence of a human being, which could create acute temporary physiological changes which may influence the direction of various experimental treatments.

In one instance, two months were required for captive baboons to develop stable blood chemistry values (Steyn, 1975). Other physiological and behavioral parameters may never reach normal levels, but may oscillate according to the animal's adaptation strategies to confinement in establishing and maintaining homeostasis and ethostasis. The long-term effects of isolation on physiological processes have received scant evaluation. Herreid and Schlenker (1980) compared the metabolic rates of laboratory mice in three conditions: isolated mice, mice paired together over six days (stable groups), and mice paired with strange partners daily (unstable groups). Stable pairs had 15% lower metabolic rates than either isolated or unstable pairs. In other experiments when two mice were placed in separate metabolic chambers and connected together via an air flow, the metabolic rate of the recipient in the series was 35% lower than the donor. The data suggest that a 'factor' produced by the donor mouse was passed via the air supply into the recipient's chamber.

In an earlier study with dogs, Woods and Besch (1974) found that the rate of heat dissipation was 1.8 to 2.1 times higher when dogs were housed alone in test chambers instead of in groups of two or four. The authors postulated that this was a stress reaction to social isolation. A five-fold increase in plasma cortiocosterone has been found in rats isolated from cage-mates and kept in the laboratory overnight rather than in the animal facility. Being left in the facility in isolation resulted in lower plasma cortiocosterone levels compared to group-caged controls, (Barrett and Stockham, 1963).

Even the basic physiological and behavioral response to pain can be modified by the way in which an animal is raised. Deprivation rearing can lead to a heightened pain threshold and an apparent insensitivity to pain in dogs (Melzak and Scott, 1957) which may be misinterpreted as docility. Also in rats, rearing in restricted or enriched environments will influence pain avoidance behavior (Lore, 1969). One may wonder, since such threshold shifts are related to the animal's general state of arousal, how such variance in excitatory state influences the results of basic neurophysiological studies and product testing, particularly with analgesics. In mice, post-weaning environmental enrichment or deprivation will influence emotionality and brain weight (Denenberg, et al, 1969). All these findings raise serious questions about the nature of the uncontrolled variables and the extent of their effects on supposedly precise and well planned research projects.

HANDLING AND CARETAKER EFFECTS

Laboratory animals are, by virtue of their use, exposed to varying degrees of human contact. The contact necessitated by experimental purposes entails handling and restraint of the animal. Other forms of contact may be less obvious, but no less influential upon the animal's behavior and physiology. Routine cage cleaning, feeding and watering procedures and the mere presence of person/s in the animal room facility, can cause measurable effects on the animals.

Of most immediate and practical concern is the ease of handling and restraint. This is a function of the animal's degree of prior habituation and for many species, the degree of socialization or attachment to man. Limited (sub-optimal) human contact early in life especially during the critical period for socialization (Scott, 1962) between five to ten weeks or so of age, will result in a dog which, at maturity, will be difficult to handle (Freedman, et al, 1961). In order to avoid both hazards to laboratory personnel and to the animals, who may be rendered behaviorally and physiologically in no suitable state for any meaningful experimentation, early socialization with people is essential. For many experiments involving dogs as subjects therefore, early handling during the critical socialization period should be considered essential if not mandatory for good research.

Although the above observations pertain to the dog, in which species the most detailed studies of socialization have been conducted, the same basic principles hold for all laboratory mammals, including rats, mice, rabbits, cats and non-human primates. Like the dog, these species also undergo a period of socialization early in life, the critical period varying according to the species. As in the dog, delayed socialization with humans until after this optimal attachment period will make the establishment of a social bond difficult if not, in wild species, impossible.

Handling or "gentling" a rat during its pregnancy may result in offspring that are less emotional and easier to handle. Husbandry methods can alter the behavioral and physiological phenotype as when one operator opens the cage to change bedding, food and water, will talk to and handle the rat, whereas the other operator avoids contact. Cage systems that are more automated than others reduce the amount of human contact. This handler effect or lack thereof can be produced prenatally (i.e., during gestation), or postnatally during the first few days of life (Ader and Conklin, 1963; Morton, 1968). Even in adult rats, handling or exposure to an unfamiliar environment can affect behavior, and also plasma corticocosterone, prolactin and growth hormone levels (Brown and Martin, 1974).

The ways in which laboratory animals are raised and handled can also lead to the introduction of significant experimental variables. For example, handling infant mice early in life will influence their resistance to leukemia (Levine and Cohen, 1959). In rats, resistance to implanted malignant tumors is similarly affected by their early rearing history (Ader and Friedman, 1965). Such experimental variables may be inadvertently introduced by the caretaker's frequency of cage cleaning and whether or not the nest is disturbed, pups removed into a clean cage and how the mother reacts to such disturbances by increased attention to the nest and pups.

What these findings imply is that caretaker effects of handling must be considered and where possible, controlled, otherwise great variance among individuals of the same strain (genotype) or species may be created. This human variable must be regulated as stringently as are other aspects of animal care such as breeding, nutrition and cage size. In light of this, it would be highly advisable to create and structure a carefully programmed environmental input to insure that a known phenotype will be produced. Without experimentally programmed life histories (Whimbey and Denenberg, 1967), the variance and unknown qualities of laboratory animals will continue to cast dubious shadows on many of the research conclusions that are drawn from them.

EXPERIMENTAL VARIABLES

A major dilemma in using animals in research is that in the course of an investigation, certain variables may be unwittingly introduced because of the method of investigation. Such variables may have a direct influence upon the animal's response to a given treatment and the difficulties in controlling such variables may seem insurmountable: but they should not be ignored. They again demonstrate the interdependence of humane treatment and valid research.

The potential introduction of experimental variables during the course of routine laboratory animal care are many and, when identified and studied, often highly significant. The "queue" effect of treating animals sequentially is an often overlooked experimental variable. Dr. Treadwell of George Washington University (personal communication), for example, found in a study of adrenal cortisol precursors, that levels were lower in the last rats to be sacrificed. This effect was produced by taking rats one by one out of their colony cage in the laboratory and guillotining them in the same room. If rats were instead removed from their group one by one and decapitated in an adjoining room, this queue effect was eliminated. Dr. Treadwell terms this procedure "quiescent sacrifice", which exemplifies how close the correlation is between humane treatment and control of experimental variables.

Riley (1981) has provided a valuable review on the problem of stress in laboratory animals, showing that handling-induced anxiety-stress is a widespread, generally unrecognized and therefore uncontrolled and confounding experimental variable. When controlled, the quality and validity of research findings can be better assured. It is imperative that laboratory animals be kept under low stress conditions, which Riley outlines as follows:

> The most essential features required for protective low-stress animal housing are as follows: (i) No recirculation of noxious air that has been in previous contact with animals; (ii) partial soundproofing of the animal storage shelves; (iii) elimination of animal room vibrations and high-pitched sounds of centrifuges, vacuum cleaners, ventilation fans, and other noisy laboratory or building equipment; (iv) elimination of drafts, air turbulence, and wind-tunnel effects; (v) precise light control to stabilize circadian rhythms and to regulate light intensity exposure; (vi) segregation of males and females with respect to transmissible odors, pheromones, and other stress-inducing signals; (vii) segregation of experimental animals that are experiencing stress from normal or control animals; (viii) introduction of special minimum-stress animal handling techniques and cage cleaning procedures; and (ix) avoidance of drafty, uncomfortable, and stressful wire-bottom cages. Data also indicate that the isolation of animals, with only one animal per cage, is undesirable.

Mice kept in low-stress conditions show baseline values of 0-35 nanograms of corticosterone per ml. of plasma while mice maintained in conventional facilities have values ranging from 150-500 ng/ml. Population density and male-female proximity are significant stress-related variables. Close proximity to mice of the opposite sex caused four to sevenfold increase in plasma corticosterone which remained for more than 80 days: male mice were less affected than females. In C3H/He mice, the immunological ability to reject a tumor challenge was depressed when females were housed singly, and in males when housed either singly or in pairs. The psychosocial stress of housing in groups of 3-20 per cage was found to enhance the immunological response to implanted lymphosarcoma. In contrast, the multiple stressors of a conventional versus low-stress animal facility lead to an increased incidence of mammary tumor virus in other studies.

The act of capturing and the anxiety created by sequential capturing of test animals, as well as cage transfer from holding facilities to the laboratory bench result in an increase in plasma corticosterone within five minutes. Anxiety-stress also results in leukocytopenia within 1-2 hours and measurable thymus involution within 24 hours. In sum, an optional level of stress ("eustress") may be conducive to animal health by stimulating the immune system, while "distress" may impair this system and lead to a higher incidence of morbidity and mortality.

Riley (1981) concludes that:

> "The influences of uncontrolled stress in animal studies, particularly in studies with rodents, call for (i) a more universal consideration of these factors in the design of experiments; (ii) establishment of a low-stress environment for animal housing; (iii) special considerations in the manipulation and handling of experimental animals; and (iv) attention to time factors in terms of minutes, when blood samples are being removed for the establishment of meaningful corticosterone and related values. Because of these largely unappreciated and uncontrolled elements, the question arises as to how much of the present and past work with small animals may be severely flawed. In any event, the information now available calls for a reassessment of the current standards for laboratory animal housing and for techniques related to animal experimentation." (emphasis added.)

Housing animals in groups will influence their response to a number of drugs (Kosman, 1965). Psychosocial stimuli (i.e. stimulation by cage mates) may produce prolonged systolic hypertension in mice (Henry et al, 1967) and may lead to renal and cardiovascular pathologies (Henry and Stephens, 1969). Psychosocial stimulation has also been shown to influence the enzymes involved in the biosynthesis of adrenaline and noradrenaline. Catecholamine enzyme levels increased in colony-linked and regularly caged laboratory mice compared to socially isolated controls. Significantly, sudden stimuli (fear, aggression) were not found to cause any significant increase in catecholamines (Henry et al, 1971).

The toxicity levels of a number of drugs have been shown to be influenced by prolonged individual caging (Wiberg and Grice, 1965). Isolation stress in rats has been shown to influence myocardial electrolytes and epinephrine cardiotoxicity (Raab et al, 1968). Central nervous system depressants show decreased potency in mice after prolonged social isolation (Baumel et al, 1969). Baer has presented a detailed review of several studies that have shown how reduced psychosocial stimulation affects drug responses in rodents (Baer, 1971). One investigator applied this social isolation model as a neuropharmacological test (Barnes, 1959).

These studies serve to remind us that the inter-relatedness of behavioral and physiological processes is extremely complex and cannot be properly investigated by being too reductionistic and mechanistic. As with making a single unitary measure of behavior, similarly reducing a complex organism to one or two physiological or biochemical parameters may also be meaningless in the final analysis. This necessary reductionism must be balanced by a more holistic view of natural processes and variables such as psychosocial stimulation and circadian periodicity. The quality of animal care and animal research may then be improved, complementing a more enlightened view of human health and medical treatment.

ALTERNATIVES AND NEW DIRECTIONS

From the foregoing review of the many variables which are often uncontrolled in the research animal and the laboratory environment, the concerns of scientist and humanitarian find a common ground. There is a dire need to improve the conditions in which research animals are kept, and to explore and evaluate alternatives and new directions for the future.

We may begin by asking the laboratory animal certain questions in the form of carefully designed ethological experiments (see Kavanau, 1977: Dawkins, 1976; and Duncan, 1978). This way we may discover what normal physiological processes, needs and behaviors have been intensified, suppressed or otherwise altered in the process of rearing, cage confinement and general care in the laboratory animal environment.

Skeptics might argue that a highly inbred laboratory rat, for example, is pre-adapted to the laboratory environment. As such, it is quite content in an otherwise empty wire cage. A casual observer might agree, seeing no signs of stress or of physical or behavioral pathology in the caged animal. But we have not asked the animal, which one can do quite easily.

Over 40 years ago it was shown that the white rat, if given a choice, prefers to explore a maze rather than remain in its own cage. The animal's need for varied stimulation, its drive to explore and its obvious enjoyment of having access to something more stimulating than a small barren cage were dramatically demonstrated (Nissen, 1930). The investigator placed a highly charged electrical grid on the floor to block the rat's access to the maze. The rat, however, would cross the grid, preferring to be subjected to painful electrical shock than to be denied the opportunity to spend time outside of its cage in an exciting maze.

Since this significant study, other investigators have shown how other laboratory animals such as rhesus monkeys and dogs will work in order to obtain visual access to companions or to a more interesting environment outside their barren cages. When given a choice, laboratory raised animals will seek out the environment (or an artificial facsimile) for which they are best adapted and within which they can satisfy their various physical and social needs. Habitat preferences have been demonstrated in laboratory mice, enhancing reproductive performance (Iturrian and Fink, 1968).

Few such elegantly simple preference studies have been conducted on the various species that are kept for research purposes. This is surprising, since they might be healthier, happier and more representative of normality if such animals were to be provided with a more natural environment (Fox, 1966).

Studies have also been conducted using the same quantifiable behavioral indices to compare wild, free and caged groups of animals. Baboons show a higher frequency of behaviors in captive groups (Rowell, 1967) although no significant qualitative differences in behavior were noted. Under more restrictive conditions, where space, objects in the environment to manipulate, and conspecies with whom to interact, are reduced, the quantitative and qualitative changes compared to the norm become increasingly apparent. Stereotyped behavior is one class of actions which are qualitatively different from the norm and which may show a quantitative shift depending upon what environment factors have been subtracted or added (Berkson, 1968). The baboon study (Rowell, 1967) demonstrates the feasibility of applying direct observation and ethological analysis of behavioral data to determine to what degree a given method of laboratory housing affects normal behavior and social relations.

Certain management practices can lead to serious problems in animals kept in social groups when such practices are socially disruptive. Kaplan et al (1980), for example, found that mortality resulting from fighting in their breeding colony of rhesus monkeys living in groups was an important management problem. An attempt was made to understand the causes of such fighting and reduce it. They found that the cause of the fighting was the social disruption resulting from a breeding protocol which required the regular removal of pregnant animals from groups and introduction of nonpregnant females. The basic protocol was not changed; however, social disruption was minimized, and a reduction in mortality was accomplished through alteration of group formation procedures, pregnancy palpation procedures and group composition. The practical problem of disrupted sexual behavior in a breeding colony can arise from early social deprivation.

Perhaps the answers that are being sought today in much biomedical research reflect an over-specialized and reductionistic conceptual and operational approach to health and disease. This probability certainly warrants serious scrutiny, considering the fact that much research and investment of talent and tax money goes into animals that may be abnormal 'phenodeviants' when used. Those in whose care and jurisdiction lies the welfare of animals in research - in basic and applied research, in teaching and in product development and testing - should encourage the research and academic establishments to re-evaluate the entire field of animal utilization. This is not only because of scientific and humane concerns over the diverse uses of animals, but also because of the endless proliferation and often needlessly repetitive experiments and tests that are being conducted on them.

Many clinicians would agree that a high percentage of laboratory animal research seems to bear little relevance to human problems, and little promise of ever being of value. Studies of forced morphine addiction in mice or "learned helplessness" in rats and dogs, for example, are perhaps only relevant in terms of other people's studies on such clinically non-relevant phenomena in other rodents. That some experiments involving animal pain or suffering are justifiable does not mean that all can be justified. Such experiments should require special justification.

Aside from the care, housing and general treatment of laboratory animals, in part protected under the Animal Welfare Act, there are a number of problems related to their use which this act does not cover. Somewhere a line needs to be drawn as to when a given experiment or teaching exercise is inhumane or unethical: in other words, when an experiment is (a) a needless repetition of research already well documented (a common flaw of high school and college science projects), (b) when the degree of physical or psychological suffering of the animal overrides any possible value derived from such a study, either as a learning experience (for the student) or as a contribution to scientific knowledge, (c) when a more humane alternative is available, or when an organism of lower sentience (or tissue or egg embryo preparation) may be used as a replacement, (d) when the experiment is poorly designed with inadequate hypotheses, controls and statistical validation, (e) when the researcher cannot justify the use of animals for the betterment of society or of the animals themselves, and (f) when the experiment is conducted purely for profit motives, and not for the ultimate benefit of society, as in the development and testing of new, non-essential commercial products.

The above six categories warrant further clarification and the following examples will suffice to illustrate the main thesis of this critique: that the interests of animals in research are being violated to such a degree that they virtually have no protection. This is partially due to the fact that the Animal Welfare Act is not being effectively enforced. More significant, however, may be the fact that much of the inhumane and unethical use of animals in research reflects a particular attitude of mind, ingrained through training, in certain biomedical scientists and students. The following subjects epitomize examples of animal abuse in research studies that were conducted during this past year.

(A) Needless Repetition - High school science fair projects: injecting rats with weed killer, hamsters with valium, or with common household chemicals to see what would happen. Inducing acute myocarditis in guinea pigs by injecting a myolytic agent into their hearts. College projects: blinding rats and giving drugs (such as amphetamines) to see how their performance in a maze is affected; effects of electroshock, starvation and other variables on fighting in rodents; conditioned aversion studies, "learned helplessness", maternal deprivation in primates and prolonged social deprivation. All these phenomena are well documented and further repetition is needless as well as inhumane. Inflicting pain or suffering in an animal purely for educational purposes and not for the betterment of animal or human health is ethically untenable. One may also question some "teaching" experiments in veterinary and medical schools: poisoning dogs with strychnine and other toxicological agents; inducing Clostridia infection and other diseases in sheep and guinea pigs; stomach-tubing dogs with chloroform to destroy the liver and keeping them alive for several days for blood studies; repetitive surgery on the same animal over several weeks.

(B) Unjustifiable Suffering - One class of studies will suffice here: the prolonged restraint of primates in holding chairs for weeks, sometimes months, for a wide range of studies. The ethics of using such animals for evaluating the effects of addictive drugs and other self-induced poisons (tobacco, alcohol) is also to be questioned. Drug addictions in man are related to emotional and societal ills, and may be interpreted as symptoms rather than causes. To mimic such symptoms in animals does little to alleviate the underlying causes in man.

(C) Need for Replacement/Alternative Species - Again, one example will suffice: the research of Nobel laureate D. C. Gajudsek included the use of reportedly over 120 chimpanzees, a threatened species. The use of this species must be questioned since the researcher himself admitted almost ten years ago that more plentiful squirrel and rhesus monkeys could have been used instead. The Ames bacteria test method for rapid screening of potential carcinogens is one particularly promising partial replacement for higher life forms. Other replacement alternatives are needed in biomedical research and testing not only for humane reasons, but for economic ones as well.

(D) Inadequate Experimental Design - A look at many college honors and higher degree theses will not only reveal the high frequency of needless repetition described in (A) above, and also elements of (B) above, but also inadequacies in design. Lack of originality and genuine creativity may cast doubt on the value of many Ph.D. degrees. Weaknesses in design often lead to excessive numbers of animal subjects being used, and groups being discarded when results don't turn out or when everything has to be done over again. It should be emphasized that in many small colleges, students take care of their own animals. Students may be inexperienced, untrained, indifferent and are generally unaware of the Animal Welfare Act. At one college, a large rat colony was virtually wiped out twice by student caretakers not providing them with water during the summer.

(E) Non-Relevant "Basic" Research - The category of "basic" research is a politically sensitive area. Suffice it to say that some scientists still "sacrifice" animals simply to satisfy their intellectual curiosity. The academic pressures to publish (or perish) are real too, and result in a number of needlessly repetitive experiments or "variations on a theme". To add further to the volume of scientific knowledge that has no relevance to the contemporary problems of mankind, is not only a confusion of priorities but a gross misuse of public funds. This should not be interpreted as an inditement of all basic research, but rather as a plea for a more purposive approach to basic research. Many "basic" studies could be terminated by the investigator asking "do I really need to know what I think I want to know," for example, the investigator who wants to know how the coatimundi moves its nose. A chance "break through" discovery, a new line of investigation, could come from such work, but surely this is a blind way of "fishing", an unscientific hit and miss game of chance.

(F) Commercial Testing - This area, above all others, warrants rigorous review, reforms in established procedures and a total re-evaluation of standardized methods are urgently needed. Such gross tests as stomach-loading dogs with new floor or boot polishes to establish an L.D. 50. (which is a wholly unscientific measure). The Draize eye test is another atrocity. Perfumes, deodorants and other nonessential commercial products being placed into rabbits' eyes until the concentration known to cause severe eye inflammation can be quantified. Analgesics are rarely used, because, it is argued, such drugs may interfere with the test. Many of these tests are not only inhumane, but are poor science and needlessly repetitive, one company being obliged to replicate the tests of another because of federal regulations or because of company policy not to share or make public their test data. Other tests no less inhumane, include the instigation of acute pain reactions by a variety of bizarre methods in developing new analgesics.

The fact that such conditions and experiments are still to be found demands our immediate concern and concerted action. No rational mind can defend or adequately justify any of the examples cited in the aforementioned six critical areas of concern. That such animal abuses exist at all, irrespective of rationalizations justifying their continuation, surely warrants the concern and active intervention of all responsible and influential persons.

Accountability is supposedly upheld through the peer-review system for research grant awards and approval, but unfortunately this system is inadequate for many reasons, notably (a) professional etiquette (one does not criticize one's peers or superiors, especially they may some day be reviewing one's own research proposal); (b) the supposed societal value of performing a given experiment is compounded and confounded by other values which in no way justify animal sacrifice or suffering. These include academic status, tenure, scientific recognition, additional income and prestige for the university or research institution; (c) finally the value of adding further knowledge to a particular discipline is rated high by those within the discipline (no one wants their speciality and life's endeavors de-valued or discredited). This is very different from valuing such knowledge in terms of benefiting society. Silverman (1978) summarizes the above by stating succinctly that "a cost-benefit analysis is necessary at the planning stage of an experiment. How great is the likely benefit to mankind at large? What is the private benefit to the experimenter, in terms of money, prestige, or a Ph.D.? And what is the cost to the animal?"

Some solutions to the above problems concerning the use and abuse of animals in research are being developed. Criteria for objectively evaluating research proposals have been developed by the Institute for the Study of Animal Problems (a division of the Humane Society of the United States). These criteria, which were decided on the basis of an extensive survey of Federally funded research projects, would enhance the system of peer-review of grant applications.

Another important screening of research studies can and should come at the level of final publication: journal editors should have objective criteria upon which they may appraise a scientific paper on ethical and humane grounds. A special editorial committee may be necessary to hear the pros and cons of a paper rejected on ethical grounds if the author contends that the scientific or medical value of the paper over-rides the usual humane and ethical restraints established by the journal.

Better monitoring by the USDA is also urgently needed in the procurement and transportation of animals to research laboratories and universities. I have seen the facilities and operations of federally licensed dealers supplying animals for research which, on the basis of inhumane and insanitary conditions, should have had their state and federal licenses revoked. Some state and federal veterinary inspectors are either ineffectual or incompetent and indifferent. The source of supply should also be better regulated: stealing pet cats and dogs and selling them even under USDA license, for research, may be difficult to prove but is a highly suspected and probably widespread practice in some areas, particularly in the Eastern states.

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STATEMENT OF THE FRIENDS OF ANIMALS, INC.

In considering all of the bills designed to 'reform' the federally funded research community and advance the cause of humanity toward animals, Friends of Animals supports the Research Modernization Act, H. R. 556.

Friends of Animals is a national animal rights organization. Time and again we have supported legislation which furthers animals rights. The Research Modernization Act is such a bill which champions the cause of animals rights, promising to remove many of these creatures from the lab and abolishing abuses such as those involving monkeys recently exposed at a laboratory in Maryland.

But we also support this bill because it champions human rights -- specifically the right of all Americans to the best health care possible by the most modern methods available. The Research Modernization Act will do much toward fufilling both of these promises.

In 1979 Friends of Animals began an objective effort to assess the feasibility of substituting 'alternative' experimental methods for animal research methods. Our core effort involved enlisting over two hundred doctors, medical and university personnel to review government research grants. These grants were randomly selected. Information was obtained under the U. S. Freedom of Information Act.

What we found was appalling. Of all the grants reviewed, and they numbered in the hundreds, 60% were found to be unexceptable. Experiments originally intended to be done in vitro -- either using animal or human cell tissue -- were switched to using live animals, driving up the cost and producing no results. One of these reviewed involved a grant of $100,000 annually, and has been going on for over five years. Carried out by researchers at the University of Iowa, the experiment proposed to research, document and explain the chemistry of methanol metabolism in the body in the hope of finding a way to treat or undue its tissue damaging effects. During the early phase of this work research was performed on human autopsy tissue -- liver tissue and retina tissue; later they switched to live primates. We won't go into what they subjected the animals to. We will say, use of live animals produced no more conclusive results than the original cell studys. And while noone can doubt the noble goal of this work, any sane person must question why, when the same conclusions can be drawn from using the tissue of the organism, in this case the human, on which the effects are going to be studied, they ever switched to the less accurate model of live primates?

Our research also uncovered experiments using animals which could have been completed using alternatives in less time and at less cost. Another experiment funded by the National Institute of Alcohol Abuse conducted by researchers at Massachusetts General Hospital in Boston, was set up to determine the effect of alcohol on the subcellular organelles of the liver. This experiment has been funded for at least nine years. In 1977 alone, (the year for which we have records) $65,000 was spent. Over this period rats and baboons were fed alcohol. Researchers finally concluded that, yes, alcohol does damage the liver. In reviewing this experiment our reviewer cited many effective tests using bacterial assay -- such as the Ames test or another test recently developed by Raymond Devoret (Scientific American, August 1979, Bacterial Tests for Potential Carcinogens) which could have been used far more cheaply, consuming less time and producing more sensitive and conclusive results than research experiments such as the one just detailed.

We found ongoing experiments with theorys proven long ago -- such as the experiment testing the feasibility and safety of using radioactive isotopes in the body to detect organ abnormalities conducted at Johns Hopkins University. Funded over 14 years by the National Institute of General Medical Science the research used close to $300,000 in 1979 alone. According to our reviewer, 'While this project produced useful results in the late 1960's, it has, for the past ten years, been living off past glory. The project has been reduced to repeating 'experiments' on animals that cannot be justified. These techniques being tested are no longer experimental but are used daily on human patients undergoing nuclear medical procedures in every hospital in the country.'

And we found inane experiments, such as those on human sexuality using mice. Conducted for 16 years at Williams College this project purported to study how genetic, environmental, and physical variables act and interact to produce differences in behavior. And to create an animal model of the human female sexual response by manipulating the hormone levels in the mice. Again we must ask, "why is money going towards studying mice as models of human female sexual response while during the same period the studies of Masters and Johnson have made enormous strides in our understanding of human sexual functioning by studying humans?

Friends of Animals has long asserted that studies on animals are not the answer to all our human health needs, and yet over 60% of the research projects funded each year use animals. The Research Modernization Act would, to a large extent put an end to these abuses and do much toward improving health care options in this country.

Opponents argue that 30% to 50% of the funds is too much and will cripple the research community. Facts such as this medical research review project show otherwise. Reallocating 30% to 50% would only eliminate the waste of senseless experiments such as those detailed earlier. It is not a bill designed to destroy the research community. It is designed to strengthen, educate, teach, develop and improve this community.

In discussing this bill it must be remembered that the bill poses no restrictions whatsoever with one single exception. When alternative testing methods are determined to be more valid than those using animals, that alternative must be used if the funding for the research is provided by the federal government.

It doesn't reduce research spending a dime. Today there is about $3 billion in federal tax dollars spent each year on research. There will be three billion dollars spent after the passage of the act. It advocates using the best methods of research possible. But it goes one step further to say, let's not only use them, let's develop them.

Finally, it must be remembered that this bill does not include a choice between animal health and human life -- instead it means a step forward for both.

We cannot stress strongly enough the need for the full 30% to 50% reallocation. To reduce it would reduce the bill to impotence. A worthwhile and comprehensive effort must be made. The government funders and the research community must recognize the need to move science into the 20th century, even if it means teaching a few old dogs some new tricks.

Daily the research community reports -- especially in studys which involve today's greatest scourge, cancer -- the superiority of cell, tissue, computer, instrument, and mechanical tests in furthering our understanding, developing treatments and cures for diseases affecting humans. But more must be done to encourage these developments -- to teach our researchers -- to educate the next generations in new and better techniques.

Animals have been used since time immemorial and noone can deny the advances science has made, but there comes a time when a nation which years ago put a man on the moon, and today designs a spaceship like Columbia can also design and improve research methods to further the goals of humanity on earth.

The public deserves the best health effort we can give them -- especially when they are footing the bill. Just because a researcher is more comfortable with an animal than a computer is no reason to leave science behind in the 19th century while we move into the 21st.

Thank you.

STATEMENT OF THE FUND FOR ANIMALS, PRESENTED BY LEWIS REGENSTEIN

THE CRUELTY OF LABORATORY EXPERIMENTS

Each day, several hundred thousand animals are killed in medical experiments. And they are the lucky ones. Some unfortunate creatures spend years, their entire lives, in small cramped cages, undergoing agonizing torture in the name of medical science.

The suffering caused to laboratory animals is so enormous as to be beyond description, and much of it is unnecessary and unproductive. Each year, some 60 to 90 million animals are used in U.S. laboratoriesand schools. Estimates of the number of animals killed each year for American medical research commonly range from 64 million to 90 million.[1]

A major problem, Dr. John Beary observes, is that so many of the brutal experiments done are redundant and characterized by:

> poorly designed and trivial research which has almost no chance of producing significant information that could justify the suffering involved. Behavioral scientists in particular have an appalling record. They do the same experiment over and over with minor variations, motivated I assume to get the publications necessary for professional advancement.[2]

Beary tells of one reasearcher who restrained baboons in a chair continously for over a year and a half.[3] Another example cited by Beary of a "trivial, cruel experiment with an obvious result" was the placing of young monkeys in a steel well for 45 days to observe them, the rationale being that depressed humans often say they feel like they are "in a well." Not surprisingly, the experiment produced the finding that the monkeys "spend most of their time huddled in a corner of the chamber (showing) severe and persistent psycho-pathological behavior of a depressive nature." The report concludes:

> Whether the results can be traced specifically to variables such as chamber shape, chamber size, duration of confinement, age at time of confinement, prior and/or subsequent social environment or, more likely, to a combination of these and other variables remains the subject of further research.[4]

Many such experiments are carried which are unnecessary, add nothing of significance to human knowledge and/or are performed to receive research grants, or by students to obtain credits or satisfy a course or degree requirement. Wayne State University, for example, routinely used live baby chimpanzees, instead of readily available dummies or cadavers, in automobile smash-up tests to determine how air bags prevented injuries and deaths.

Some of the cruelest, and most senseless, experiments are carried out on primates, creatures highest in the evolutionary scale and most like us; the very animals that will, in short, experience the most acute suffering. Such experiments, routinely funded by universities and the government and published in medical journals, are described in the periodic bulletin of the International Primate Protection League in Berkeley, California. One experiment by Dr. L. D. Leape, from the University of Kansas Medical School, consisted of dipping ten rhesus monkeys in boiling water for 15 seconds in order to observe for four hours tissue changes in burned flesh.[5]

A series of three sets of experiments by Gershon Berkson, of the University of Illinois, funded in part by the National Institutes of Health (NIH), consisted of blinding infant monkeys, most of which were returned to the wild with their mothers. This research concluded that "the effects of the visual deficit were apparent. The experimental animals made their way slowly in the mangrove, groping for roots as they went...in social play, they were clumsy."[6] The blinding of other monkeys at birth produced the predictable conclusion that "surgery affected acuity of the experimental animals to the extent that significant aspects of the behavior repertoire were altered."[7]

Dogs -- often pets stolen from their owners and sold to labs -- are also frequently used in medical experiments. In order to prevent them from barking, howling, or whining in pain, thus disturbing the researchers or people in adjoining buildings, their vocal cords are usually cut. Sometimes dogs are forced to ingest the smoke from several packs of cigarettes a day to prove -- for the umpteenth time -- that smoking causes cancer. In 1973, the U.S. Air Force created a public uproar when their poison gassing of beagles was publicized. But millions of beagles and other dogs continue to be subjected to even greater suffering every day with little or no public attention being paid to it. Beagles are so often used because of their docile dispositions and friendly nature.

In what a New York Times editorial called "Prizes for Torture," high school students are often rewarded with prizes, travel vacations, and publicity for carrying out cruel experiments on animals. In the Westinghouse Science Talent Search, held on March 1, 1969 at the Sheraton Park Hotel in Washington, D.C., an eighteen-year-old high school girl gave an account of how she had starved five house sparrows for six days to show that "Birds are likely to die when starved to 70 percent of their body weight." The birds, bought for 35¢ apiece, had first been blinded, a procedure she had learned at the University of Texas at Austin where she gone on a National Science Foundation grant. Her account of these "experiments," and her plans to "shock and injure" birds in her next project, was given to a group that included children six to eight years of age.[8]

WIPING OUT ENTIRE SPECIES

Another problem related to the use of primates for research is that the insatiable demands of medical researchers (mainly in the United States) for "specimens" is stripping the world's jungles of these creatures. The normal way of obtaining monkeys, apes, and other primates is by "mother shooting": shooting the mother out of the tree, and capturing the terrified infant. If the young primate survives the buckshot and the fall, it is thrown into a burlap bag and transported to the nearest animal dealer, to be eventually shipped to the laboratory, usually in the United States. The mortality rate in transit is enormous, and many primates have to die in order to provide one healthy specimen for the researcher.

Almost all species of primates are now on the U.S. Department of Interior's endangered or threatened species lists, which generally restricts the imports from abroad of these species. However, the Endangered Species Act provides an exception for "scientific research," so large numbers of import permits are routinely granted each year. By 1979, about 25,000 primates were being legally imported for laboratory research (not counting those smuggled in). This is considerably less than were being imported in previous years (over 85,000 in 1970) for all purposes, and the decrease in imports is due largely to the fact that there are now far less primates remaining in the wild, which has led several countries to ban export of their monkeys. The Merck drug company has repeatedly tried to obtain permits to import 125 chimpanzees for research, even though this species -- perhaps our closest relative -- is seriously endangered and is on the threatened list.

Moreover, pressure from the medical research lobby has helped prevent the Interior Department from adding imperiled species such as spider monkeys to the protected lists. The official position of the researchers was enunciated at a 1973 meeting at the U.S. State Department to discuss a pending treaty to protect imperiled species, the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). At this meeting, Dr. H.E. Kingman, Jr., executive director of the National Society for Medical Research in Washington, D.C., argued that if there were just two chimpanzees left in the world, he would not want to "close the door" on using them for research.[9]

ALTERNATIVES TO USING ANIMALS

The enormous suffering to which animals are unnecessarily subjected in many medical laboratory experiments has prompted calls from the medical profession itself for the formation of "bioethical" standards to guide researchers on what should and should not be permitted. Since most such experiments are funded by the taxpayers, through the National Institutes of Health (NIH), this issue is one especially appropriate for public concern.

One medical doctor active in this area is John F. Beary III, a Washington, D.C., internist and rheumatologist. Along with Christine Stevens, head of the Animal Welfare Institue in Washington, D.C., Dr. Beary was instrumental in helping to draft guidelines for biomedical research involving animals, which were supported by NIH and became effective in January, 1979. They supposedly discourage experiments where the expected research gain does not justify the suffering to be inflicted, and encourage minimizing pain and eliminating it where not necessary. It remains to be seen to what extent these guidelines will be effective, but their potential for helping millions of animals is enormous. Dr. Beary, in an article in The American Biology Teacher, described common Collip trauma-drum experiments which mutilate small mammals by breaking their teeth, lacerating their eyes, and crushing their genitilia, with the object of placing the animal in shock and studying it. Dr. Beary observes "I am aware of no vital information important to the actual practice of medicine which has been derived from these studies. In any event, some knowledge can be gained at too high a price...To paraphrase the late Dr. Joseph Wood Krutch, 'There is no need to poke out an animal's eye to prove that it interferes with vision.'"[10]

Dr. Beary goes on to describe various alternatives to using live animals that would be equally effective in accomplishing their purpose. For example, instead of dissecting millions of live frogs each year in high school biology labs, models can be used, or films that show that the heart moves as it beats or of open heart surgery, if that is the objective.

Beary also points out that, as with the general subject of cruelty to animals, the lack of bioethical attitudes in reasearch experiments can lead to abuse of human, as well as animal, subjects. "There are retarded human infants who can never attain the intelligence level of a dog, a dolphin, or a primate," he observes. Does this justify doing research on such human subjects? If that seems a far-fetched line of reasoning, consider the painful and lethal medical experiments carried out by the Nazis on mentally retarded people, Jews, Gypsies, and other "inferior races."

It could never happen here, you say? In the Tuskegee syphilis study, in Alabama, penicillin was withheld from black syphilis victims in order to study what would happen if the disease were allowed to proceed untreated. For similar reasons, retarded children in Willowbrook, New York, were given hepatitis. In the early 1960's, the U.S. Army also gave the powerful hallucinogenic drug LSD to unwitting young soldiers, one of whom was killed when he jumped out of a window as a result of his experience.

Did an early desensitization to the unnecessary suffering of animals in the name of science lead to similar treatment of helpless humans? Dr. Beary writes that this could indeed be the case:

> Invasive animal studies can desensitize immature students and may interfere with the development of bioethical standards needed by adult investigators. Furthermore, invasive studies conflict with the compassionate values which most students hold and may result in aversion to further biology study. I am personally familiar with a bright young woman who discontinued premedical studies because of this issue.

Dr. Beary concludes that biology teachers have the responsibility not only to impart information but to develop attitudes which will influence the quality of the decisions made by students in later life. He ends by calling for an emphasis on a bioethical concept he terms "philobios," which refers to an attitude of love and respect for the dignity of life in all its varied forms.

Other medical doctors have condemned the abuses of animal experimentation as harmful to both humans and animals. In an article in The Washington Star, writers Ronn and Jeanne Brackin state:

> ...according to Dr. Abel Desjardins, former president of the French Society of Surgeons, not only does the beginner learn nothing of the true surgical techniques, but his character is corrupted. Vivisection teaches a person to attach no importance to the pain inflicted on living things.[11]

The Brackins go on to describe the unreliability of animal experiments, and cite the fact that penicillin can kill guinea pigs, but they can safely consume large amounts of strychnine. And then there is the drug Thalidomide, which was taken by pregnant mothers and produced massive deformities on their children. When it was first put on the European market in 1961, as Sistaval, it had been tested on thousands of laboratory animals for several years, and carried the assurance, "Sistaval can be given with complete safety to pregnant women and nursing mothers without adverse effect on mother or child."[12] Thalidomide was kept off the U.S. market largely through the efforts of a Food & Drug Administration bureaucrat, Dr. Frances Kelsey, not because of the results of animal tests. It did not produce deformities in the fetuses of the dogs, cats, and hamsters on whom it was tested. But one-hundredth of the dose given safely to laboratory animals caused horrendous birth defects in human infants.[13]

The unreliability of animal tests is well-known, and the results of identical tests often vary from one research facility to another. In fact, the cruel conditions of medical labs may render test results largely invalid. Overcrowding, cramped and filthy cages, social deprivation, and other trauma and stress brought about by fear and pain affect the body chemistry, behavior and metabolism of test animals.

The United States does have an Animal Welfare Act, passed in 1966 and amended in 1970 and 1976. But the law is pitifully weak, ridden with loopholes, and covers only about four percent of the animals used in labs.

The best hope for ameliorating this problem seems to be in the search for alternatives to research. Beauty Without Cruelty, a humane group based in London and New York, promotes and sells perfectly fine cosmetics that have not been tested on animals, as most are. Tests are also being conducted to try and perfect a technique already in use that employs Salmonella bacteria instead of animals to predict the cancer-causing properties of chemicals.

The so-called Ames Test, developed by Dr. Bruce Ames and Joyce McCann of the University of California at Berkely, takes advantage of the fact that bacteria contain such genetic material as genes and chromsomes that is similar to that of humans. When a normal cell is transformed to a cancerous one, the cell's genetic material is altered, and such an effect can readily be observed in bacteria exposed to a carcinogen. Tests on hundreds of known carcinogenic chemicals using the Ames system produced positive results in over 90 percent of the cases.[14] And another test for carcinogenicity has been devised that employes human cells and takes a week to perform at a cost of about $1,000, as opposed to the usual method, which uses animals, takes three years, and costs over $200,000.[15]

THE LACK OF JUSTIFICATION

In the final analysis, the justification for experimenting on animals becomes a contradiction. As Patricia Curtis points out in her article in The New York Times Magazine, experimenters "defend their work scientifically on the basis of similarities between humans and animals, but defend it morally on the basis of the differences." As British psychologist Richard Ryder points out, they cannot have it both ways. "Suppose," he asks, "we were to be discovered by more intelligent creatures from elsewhere in the universe. Would they be justified in experimenting on us?"[16]

The massive and unnecessary abuse of animals that takes place in medical labs is unparalleled in the cruelty, waste, and suffering that is involved. This is a moral and ethical issue that a person of conscience cannot ignore. Speaking of vivisection and other painful experiments on animals, Reverend Basil Wrighton, of the Catholic Study Circle for Animal Welfare in London, has stated:

> ...it is impossible to think of anything more cruel. Yet this monstrous thing, which crept into the world behind closed doors and in a shamefaced conspiracy of silence, has now become the openly acknowledged tool of research for the biological and medical sciences, used on a colossal and ever-increasing scale, subsidized by governments and universities, endowed by the legacies of the rich, and even promoted by religious institutions. This fact, I think, represents an unparalleled capitulation to evil by the world we live in.[17]

Statement for the Record

Hearings on the Use of Animals in Medical Research and Testing
Subcommittee on Science, Research and Technology
Committee on Science and Technology
United States House of Representatives

by
Michael Gough, Ph.D.
Office of Technology Assessment
United States Congress

October 7, 1981

These hearings, directed at the use of animals in medical research and testing, raise the issue of alternatives to animal testing. Information relevant to this issue was presented in a recent report published by the Office of Technology Assessment (OTA).

Assessment of Technologies for Determining Cancer Risks from the Environment, published in June 1981, describes and analyzes (1) data about cancer occurrence and mortality, (2) quantitative relationships between exposures to various factors and the occurrence of cancer in the United States, (3) methods for detecting and identifying carcinogens, (testing), which is the subject of these hearings, (4) methods to extrapolate from test data to estimates of human risk, and (5) regulatory laws and regulatory decisionmaking in the process of reducing exposures to carcinogens.

The OTA report described the four testing methods that are available to learn about the carcinogenicity of substances: (1) molecular structure analysis, (2) short-term tests, (3) long-term tests in intact animals, bioassays, and (4) epidemiology (Table 1). Strictly speaking, epidemiology is not a test because ethical considerations preclude knowingly administering suspect carcinogens to humans. In general, the same four methods are used to learn about other toxicities, but in the case of non-life threatening toxicities, tests in humans may be used.

Long-term (generally lifetime) testing of substances in small laboratory animals (see Tables 2 and 3) is the backbone of carcinogen identification efforts. These tests have achieved acceptance only after years of test development, test execution, and arguments among experts about what constitutes an adequate test. Although objections are raised to the applicability of animal test results to humans, animals have organ systems and metabolism much like humans, and animals, of all test systems, most nearly mimic humans.

Animal tests, although better accepted as predictors of human risk than any other test system, are expensive and take a long time. Testing a single substance costs between $500,000 and $1,000,000 and requires up to five years (Table 3). These costs impose a strict limit on the number of substances that can be examined in animal tests. Reluctance to consider other tests to replace animal tests is partly rooted in the fact that other test systems are more distant from cancer in humans than are tests that measure tumor causation in animals (see Table 1).

Molecular structure analysis allows scientists to construct hypotheses about how the substance is likely to act and it is primarily useful for guiding further testing activites. Such analysis (Table 1) makes no measurements of the activity of a substance in a biological system.

Short-term tests (Table 1) measure biological effects, but often the measured effects are not directly related to tumor causation. The best known short-term test, the Ames test, measures the capacity of a substance to cause changes in the DNA, the genetic material, of bacteria. Measurement of genetic changes, "mutations," provides a method to assay substances in a day or two at a cost of a few hundred dollars. Good data, available for more than 300 substances, allow comparisons to be made between the capacity of a substance to cause mutations in the Ames test and to cause cancer in animal tests. About 90 percent of substances that are known to cause cancer in laboratory animals also caused mutations in the Ames test, and about 90 percent of substances not causing cancer in animal tests did not cause mutations in the Ames test. These results showed that the Ames test is about 90 percent accurate. The OTA report discusses the limitations of a test that is 90 percent accurate, and points out that in cases where thousands of substances are to be tested, a 10 percent rate of falsely identifying carcinogens and noncarcinogens presents severe problems in interpretation.

Short term tests remain attractive because another test or tests might be designed that complements the Ames test. Ideally a battery of short-term tests would be 100 percent accurate in identifying carcinogens and noncarcinogens. If such a battery existed the need for long-term animal tests would be greatly reduced.

Unfortunately no battery of short-term tests has yet been shown to be appreciably more accurate than the Ames test in screening hundreds of substances. Despite that disappointment, a number of tests which measure "transformation," a complex biological event that is more closely related to carcinogenicity than is mutagenicity, have been developed and show great promise.

The step following development of a test is test validation. That second step involves testing scores or hundreds of known carcinogens and noncarcinogens by the newly-developed method to see how accurately the new test system discriminates between the two types of substances. Validation efforts tend to be expensive and time-consuming and, in recent years, have frequently been managed by Federal or international testing programs.

Federal officials responsible for testing programs have expressed optimism about short-term test development: The National Toxicology Program (NTP) Annual Plan for 1979 stated:

> A lifetime bioassay in rodents is the current procedure utilized to determine carcinogenic potential of a chemical. The NTP does not propose alternative methods but acknowledges a need in the longer term, to develop or validate less expensive and more rapid methods that may in some instances supplant the need for lifetime bioassays. Mammalian cell transformations are potential short-term assays that indicate carcinogenic potential of a chemical....

Donald Frederickson, then-Director of the National Institutes of Health, in 1979 wrote:

> The dimension of NTP, and the significant demands it places on the funds and personnel of the participating agencies, should diminish by 1985, as the fiscal projections suggest.... It is our hope that, by then, better test systems will begin to replace the tedious and costly animal assays now required.

Reforms in regulatory policy and practices are important items on the current political agenda. This atmosphere also provides an opportune time to consider what types of test information are to be admissible in the regulatory arena. This opportunity, coupled with the interest in short-term tests, argues for focusing attention on the development and adoption of short-term tests.

The OTA report presented two options about short-term tests.

- Encourage NTP to pursue the development of tests to replace the long-term carcinogenicity bioassay in small mammals.

Improvements in the design and execution of carcinogenicity bioassays in small laboratory animals have been accompanied by increased acceptance of the results as being predictive for human effects. The tests are used worldwide, scientists continue to discuss and refine them, and in the United States, NTP has improved the management of the Government test program. Despite all this progress, no improvements are expected in two aspects of the tests: they are expensive (up to $1.0 million for each substance tested) and they require a great length of time (from 3 to 5 years).

In its first annual plan (1979), NTP identified the development and validation of less expensive, quicker tests as a priority goal. NTP has outlined a testing scheme involving both short-term and long-term tests and is working to decide which short-term tests work best for identifiying a number of toxics, including carcinogens. The attention paid to short-term tests by NTP promises that progress will be made. The concentration of Department of Health and Human Services (DHHS) toxicological expertise in NTP and the development of NTP's working relationships with agencies outside DHHS assure that the program can call on the appropriate people in pursuing the goal of new tests.

Congress might encourage short-term test development and validation in its oversight activities, and it might consider additional funding for the programs. There is currently a great deal of interest in the short-term tests and additional congressional support might have a profound effect on their development.

A potential disadvantage of relying on NTP for guiding and directing this research and development effort is that NTP has many other responsibilities. As discussed in this assessment... NTP also is responsible for the management of large animal test programs. As a part of a multipurpose program, short-term test development has to compete for resources with other parts of the NTP. If it were decided that short-term tests are sufficiently important to be set apart from other NTP activities, the following option might be considered.

o Establish a commission to advise the Federal Government about optimal methods for development of short-term tests.

A commission, composed of experts from academe, industry, public interest groups, and Government agencies could be established to make recommendations about short-term tests. This would have the advantage of concentrating the talents of diverse people on test development and bringing increased attention to the tests.

The existence of a commission would problably result in short-term tests being given higher priority in NTP. The exact tasks of the commission would be decided by NTP and other parties with interest in the tests. However, one task might be the serious consideration of which, if any, tests offer promise as substitutes for long-term animal carcinogenicity bioassays when making regulatory decisions. The establishment of criteria that a single test or a combination of tests would have to meet to be considered for regulatory decisionmaking would be a spur and a guide to test development. The possible disadvantage of a commission is that it may provide nothing different from what NTP (as in the previous option) might provide.

The commission could focus attention on the tests, the most likely ways for their employment and what criteria they must meet. Adoption of this option would reinforce the conclusions already reached by many experts that short-term tests show great promise. In a major way, the commission might answer the questions "promising for what?"

Table 1 —General Classification of Tests Available To Determine Properties Related to Carcinogenicity

Method	System	Time required	Basis for test	Result	Conclusion, if result is positive
Molecular structure analysis	"Paper chemistry"	Days	Chemicals with like structures interact similarly with DNA	Structure resembles (positive) or does not resemble (negative) structure of known carcinogen	Chemical may be hazardous. That determination requires further testing.
	Basic laboratory tests	Weeks			
Short-term tests	Bacteria, yeast, cultured cells, intact animals	Generally few weeks (range 1 day to 8 months)	Chemical interaction with DNA can be measured in biological systems	Chemical causes (positive) or does not cause (negative) a response known to be caused by carcinogens	Chemical is a potential carcinogen.
Bioassay	Intact animals (rats, mice)	2 to 5 years	Chemicals that cause tumors in animals may cause tumors in humans	Chemical causes (positive) or does not cause (negative) increased incidence of tumors	Chemical is recognized as a carcinogen in that species and as a potential human carcinogen.
Epidemiology	Humans	Months to lifetimes	Chemicals that cause cancer can be detected in studies of human populations	Chemical is associated (positive) or is not associated (negative) with an increased incidence of cancer	Chemical is recognized as a human carcinogen.

Table 2 —Distribution and Number of Animals in a Typical Bioassay Study of Carcinogens

	Species A		Species B	
Experimental groups	Males	Females	Males	Females
Dosage MTD[a] group	50	50	50	50
Dosage MTD/x group	50	50	50	50
Control group	50	50	50	50

[a] Maximum tolerated dose.

Table 3 —Guidelines for Bioassay in Small Rodents

	NCI (331)[a]	FIFRA (102)	TSCA (106)
Endpoint	Carcinogenicity	Oncogenicity	Oncogenicity
Study plan:			
Animal species	2, rats and mice	2, rats and mice	2, rats and mice
Number of animals at each dose	50 males, 50 females	50 males, 50 females	50 males, 50 females
Dosages	2, MTD MTD/2 or MTD/4 plus no-dose control	3, MTD MTD/2 or MTD/4 MTD/4 or MTD/8 plus no-dose control	3, HDL HDL/2 or HDL/4 HDL/4 or HDL/10 plus no-dose control
Dosing regimen			
Start	At 6 weeks of age	In utero or at 6 weeks	At 6 weeks of age
End	At 24 months of age	Mice, 18-24 mos; rats, 24-30	At 24–30 months of age
Observation period	3–6 months after end of dosing	N.s.	N.s.
Organs and tissues to be examined	All animals: external and histopathologic examination (ca. 30 organs and tissues)	All animals: external examination; some animals: pathologic exam of 30 organs and tissues, other animals, fewer organs and tissues	All animals: external and histopathologic examination (ca. 30 organs and tissues)[b]
Personnel qualifications:			
Study director	N.s.	N.s.	Responsibilities detailed
Pathologist	Board-qualified	N.s.	Board-certified or equivalent
Animal husbandry	N.s.	N.s.	Board-certified vet. or equivalent
Cost estimate	N.s.	N.s.	$400,000 ± 160,000

Abbreviations: MTD, Maximum tolerated dose, causes minor acute toxicity
HDL, high dose level, causes some acute toxicity
N.s., not specified

[a] The NCI Guidelines specify the indicated minimum requirements. They allow for flexibility in experimental design so long as the minimum requirements are met.

[b] EPA estimates that the 40,000 microscope slides produced in this examination will require more than 3/4 of a year of a pathologist's time for analysis.

Tables from Assessment of Technologies for Determining Cancer Risks from the Environment, Office of Technology Assessment, U. S. Congress, June 1981.

HUMANE LEGISLATIVE NETWORK
Affiliated with the Palo Alto Humane Society
230 California Avenue, No. 210
Palo Alto, CA 94306

October 1, 1981

Congressman Doug Walgren, Chairman
Subcommittee on Science, Research and Technology
House Office Building
Washington, D.C. 20515

Re: HR 556

Dear Congressman Walgren:

Please include this letter from our organization in the official Hearing record.

On the grounds of enlightened self-interest, as well as humane considerations, we urge your committee to vote for the provisions of HR 556, the Research Modernization Act. The *Christian Science Monitor,* after conducting a thorough and extensive investigation of animals in research, endorsed this bill for the same two reasons. An account of their investigations was published in a three-part series, March 10,11,12/78.

Following are but a few examples of the considerable evidence that enlightened self-interest dictates the need to find and develop substitutes for animal models in research and testing.

"Pharmacology textbooks cite endless examples of drugs that were declared safe on animals, only to prove dangerous for people...During the 1976 appropriations subcommittee hearings, David P. Rall, MD, PhD, director of the National Institute of Environmental Health Sciences: 'We believe that the continuing vitality of American technological development is dependent upon the development of more effective, less time-consuming and less expensive safety tests.' " (*Family Health Magazine*, March 1980)

For more than two hundred years, since the first animal test in cancer research was performed in France, the world has probably spent trillions of dollars on animal tests, attempting to establish the causes and cures for human cancer. "Animal Cancer Data Is Invalid, Declares AMA", was the caption on an article in the Medical Tribune, March 8, 1981. The article went on to quote the American Medical Association as saying that "Carcinogenicity in animal tests does not predict risk or outcome in humans."

The Medical Tribune of May 7, 1980, reported that a worldwide group of teratogenic experts considering the role of drugs in causing birth defects stated: "animal testing does not guarantee anything about human responses."

In spite of all the money spent on cancer research using animals, the American Cancer Society's 1981 publication (Cancer Facts and Figures) states there has been a steady rise in the national death rate from cancer. In 1930, the rate per 100,000 was 143; in 1977 it was 173.

"At a recent American Cancer Society seminar, Elizer Huberman, a research scientist at Oak Ridge National Laboratories in Tennessee, revealed that the same chemical that CAUSES tumors in mouse cells under some circumstances could HALT tumor growth in human cells. Could it be that the cure for human cancer lies at the bottom of some reject pile because it gave cancer to a rat?" (Family Health Magazine, March 1980)

In determining food safety, "our current methods of working with animals cannot continue...The mechanism of extrapolating from...animals to...humans is unreliable." This according to R. Zeckhauser, as reviewed in a 1980 American Allergy Association publication editorial.

There is much evidence that many animal tests are meaningless, "giving the illusion of safety when none has been proven...Many scientists involved in these tests are aware of the failing. A number have complained privately, some to my office, but because they fear repercussion from their administrators and colleagues, they are unwilling to risk their professional position by speaking out." (Former Congressman Edward Koch, H.6064-Congressional Record-House, 6/16/77.)

Some years ago, Dr. James D. Gallagher, then director of Medical Research at Lederle Laboratories, said that government regulations forced companies into "an unscientific preoccupation with animal studies". He further stated that the "predictive value of such studies for man is often meaningless---which means our research may be meaningless." The provisions of HR 556, to create a National Center for Alternative Research, to divert a portion of Federal research funds to the development of modern, alternative techniques, and to prohibit the use of tax funds for unnecessary duplications of live-animal procedures, could end unscientific preoccupation with such meaningless animal research.

In the October 1980 Journal of Automatic Chemistry, two biomedical researchers (N.G. Anderson and L. Anderson) comment that the "art of organizing and running large collaborative ventures" has been mastered by high energy physics while, "in contrast, the biomedical sciences have so far avoided them."

By creating a National Center for Alternative Research that will coordinate the dissemination of information on new techniques and the opportunites for training in them, and that will also identify unnecessary duplications in research, HR 556 will enable the biomedical sciences to achieve the efficiences already realized in high energy physics and other sciences.

A mandate prohibiting the use of tax funds for animal research or testing when viable alternatives exist is needed to insure that scientists do use available procedures that are maximally efficient. For instance, an independent sample survey of grants issued in 1976 by three Institutes of Health (Mental, Alcohol, Drug Abuse) showed that, on the average, only one-third of the grantees had EVEN CONSIDERED the possibility of using alternatives to animal models. (Reported by Michael W. Fox, et al., Evaluation of Awarded Grant Applications Involving Animal Experimentation) The failure of scientists to explore the use of alternatives is noted by Dr. Bernard Dix, research scientist and Deputy Editor of World Medicine. He finds that "habit and tradition" prevent scientists from turning to feasible alternatives, even though they might save money.

The aforementioned investigation by the Christian Science Monitor makes it clear that a mandate is needed to insure that a fair portion of research funds is used to modernize research techniques. They found current development efforts for more efficient, less costly alternatives were haphazard, and that scientists trying to develop them said their progress was impeded due to difficulty in getting grant money for that purpose.

Dr. Dix comments likewise: "There are fashions and traditions in science...the people who control the purse strings support the traditional (animal) methods".

In Science Magazine, 5/80, Dr. Thruston Grafton, Executive Director, National Society for Medical Research, said that almost without exception, currently available alternatives were nothing more than lucky chance spinoffs of research directed to other goals.

This confirms Dr. Dix's statements that little money has been ploughed into searching for alternatives, although "there is a strong feeling among experts that there should be, and probably is, a better way of doing things". Further, history shows a "better way of doing things" does not occur unless pressure is applied to those in charge.

HR 556 mandates the needed pressure to modernize research. It will foster the development of non-animal methods that are more reliable and efficient.

We strongly urge you to vote for this important bill.

Respectfully,
Sylvia Bancroft
Sylvia Bancroft
Help Laboratory Animals Committee

Gloria Modrell

Gloria Modrell
Corresponding Secretary

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November 13, 1981

The Honorable Doug Walgren
Chairman
Subcommittee on Science, Research and Technology
U.S. House of Representatives
Washington, D.C. 20515

Dear Congressman Walgren:

We appreciate this opportunity to add to the record assembled by your Committee during its recent hearings on the Use of Animals in Medical Research and Testing (H.R. 551 and H.R. 4406).

The National Association of Life Science Industries, Inc. is a non-profit association comprised of private companies engaged in life sciences research and development and toxicology testing.

The purpose of this letter is to supplement the written record in three respects:

> First, we wish to lend our support to the expert testimony received on the imperative need to continue the use of live animals in research and testing, where necessary, and under laboratory conditions that assure proper care and treatment of the animals.
>
> We were impressed with the thoughtful presentations of the several witnesses from the academic and scientific community and from government and industry on the indispensable role of live animal models where intact higher organisms are involved and where comparable or nearly identical disease syndromes exist in animals as in humans. We could add little to the excellent statements submitted by Dr. Edward C. Melby, Jr., President of the Association for Biomedical Research and Dr. William F. Raub, of the National Institutes of Health, and we shall not attempt to do so.
>
> Secondly, we would like to note that, while it is important to develop non-animal models for research and testing, such as molecular toxicology and biomathematical models, it would be premature to categorize such methods as "alternatives" to

live models. As witnesses before your Committee testified, the so-called "alternative" forms of research and testing serve primarily as adjunctive screening techniques. They may serve to sharpen the scope of studies and to reduce the number of live animals that might otherwise be required for a study, but they do not replace the need for live animal models.

Thirdly, we wish to offer additional insights on the incentives that naturally exist within the research and testing community to accord a high degree of care to laboratory animals.

It is to the third point above that the remainder of this statement is addressed.

The initial investment in a laboratory animal, including a rat or a mouse, is not inconsiderable. Laboratory animals are carefully bred from selected strains in laboratories which specialize in producing healthy specimens. When received by the research or testing laboratory, the animals are expected to be healthy and strain-resistant to a variety of diseases, the presence of any one of which could be prejudicial to the validity of a study's conclusions. In this connection, it should be noted that the nose and mouth masks and laboratory coats and other similar protective accouterments worn by laboratory workers serve also to protect the laboratory animal from infection.

The investment in the laboratory animal is compounded each day that a study continues. It may be difficult to think of a mouse as a "cost center," but in fact each laboratory animal is progressively "burdened," in an accounting sense, with the direct and indirect costs of the laboratory operation. These include a *pro rata* proportion of the salaries of the laboratory animal technicians, the veterinary medical staff, and the scientists engaged in the study; the cost of animal feed and of the antibiotics used to protect the health of the animal; the expense of cleaning operations, of the cages and handling equipment, and of utilities. To the foregoing must be added the costs of special room ventilation. Whereas in the typical home or office the air is exchanged approximately three times an hour, it is exchanged approximately 14 times an hour in a modern laboratory for the protection of both the laboratory worker and the study animal.

Thus, a rodent for which a laboratory may have paid $1.50 at the beginning of a study may be worth about $1,000.00 at the end of a life exposure, chronic toxicology/carcinogenicity study. Typically, 400 to 600 animals are used in a large study.

It follows, therefore, that, quite in addition to humane considerations, any mishandling or indifferent care of a study animal could prejudice or nullify the validity of study results; and this, in turn, could represent an economic loss amounting to many thousands of dollars. Such negligence could not be countenanced by any modern, efficiently-managed, cost-conscious laboratory.

Compelling as the economic reasons may be, they rank well below the potential loss of critical scientific information which could result from improper handling of the animal. Should such a scientific loss occur, the sponsor of the study, be it a government agency or a pharmaceutical manufacturer, is presented with the choice either of repeating the study at additional expense or abandoning the study because of the unacceptably high costs of repeating it.

Typically, the elapsed time between the initiation of a study and the realization of its benefits in a human patient is measured in many months, often years. Therefore, the loss of benefit or delay in the realization of benefits, may be viewed as a societal expense.

Reflecting upon the unique value of the laboratory animal, one member company president puts it this way: "In our laboratories, each animal in a study must be treated as a patient."

To summarize, humane treatment of the laboratory animal should be a fundamental tenent of any research and testing laboratory. In addition, however, the scientific and economic incentives are more than adequate to motivate well managed laboratories to accord meticulous care to laboratory animals and to seek less expensive and more expeditious forms of non-animal testing where this can be done without prejudice to the ultimate human patient or consumer.

Therefore, we believe that the proposed legislation is not needed to achieve the objectives of proper care of laboratory animals and would not prevent the very isolated instances of alleged abuse.

In addition, we should imagine that it probably would be very difficult to draft legislation which, while seeking the commendable objective of improved animal care, preserves in its perspective the fact that the role of the animal necessarily is subordinated to the primary objective of improving human health.

Sincerely,

Howard C. Brown, Jr.
Vice President, Executive Director

NEW ENGLAND ANTI-VIVISECTION SOCIETY
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October 13, 1981

Hon. Doug Walgren, Chairman
Subcommittee on Science, Research and Technology of the
Committee on Science and Technology
House Office Building
Washington, D.C. 20515

Dear Representative Walgren:

On behalf of the New England Anti-Vivisection Society's 14,000 members, I thank you and your committee for the opportunity to present you with our views regarding H.R. 566, The Research Modernization Act.

The goal of our society is to work toward the total abolition of the practice of vivisection. We consider experimentation on living animals to be a defenseless practice. We also believe that results from animal experimentation are highly suspect when attempts are made to extrapolate the findings to human beings.

There are those in the animal research industry who will tell you that we anti-vivisectionists are all unreasonable people. I will tell you that our members come from all walks of life and are wonderful people who share a great concern for all living creatures. We are also pragmatic people who understand that our goal of abolishing the practice of vivisection can only be accomplished if viable non-animal alternatives to existing animal research procedures are developed. We recognize that the animal research industry is big business. In fact, it is a billion dollar industry highly subsidized by U.S. taxpayer's dollars.

We are excited by H.R. 556 because for the first time some of these billions of federal research dollars will be directed to finding non-animal alternatives.

The Research Modernization Act calls for no appropriation of additional funds. Funding for medical research would not be reduced, however, 30-50% of the research money now being used for live animal studies would be used for development of non-animal research alternatives. We believe that passage of the Research Modernization Act would be a tremendous inducement for scientists to develop non-animal research techniques.

We have been and continue to be actively engaged in the search for non-animal alternatives to live animal experimentation. We were instrumental in negotiations that have led Revlon and Avon to commit 1.5 million dollars to the search for a non-animal alternative to the Draize Test.

We have also recently funded a $100,000 grant to Tufts University Medical School to help develop an alternative to the Draize Toxicity Test. In addition, we are working closely with Dr. William Douglas of Tufts University to develop a program to train research scientists and toxicologists in the use of currently available in vitro bio-assay methods of testing.

As you can see, we are vitally interested in passage of H.R. 556, The Research Modernization Act. On behalf of our 14,000 members we hope and trust that you and your committee will work to secure passage of this landmark piece of legislation.

Very truly yours,

Robert M. Ford

Robert M. Ford, President

Statement on the Use of Animals in Medical Research and Testing

Pharmaceutical Manufacturers Association

The Pharmaceutical Manufacturers Association, a voluntary nonprofit association of 141 companies that develop, manufacture and market prescription drugs, medical devices and diagnostic products, is vitally interested in the use of live animals for medical and scientific research. The PMA, therefore, submits the following comments for the record of the House Science and Technology Subcommittee on Science, Research and Technology on its hearings on Oct. 13-14, 1981 on the use of live animals in medical research and laboratory testing.

Like the subcommittee, the PMA is concerned about the unnecessary and inappropriate use of animals in medical and scientific laboratories and opposes such practices. Some unnecessary animal testing may be mandated by the Food and Drug Administration and other government agencies, and their regulations should be reviewed to determine whether such testing can be reduced.

In their operations, PMA member firms maintain the highest standards of care for laboratory animals and make every effort to ensure proper treatment for such animals. In addition, the PMA and its members encourage the use of alternatives to animal testing whenever possible. This was reflected in a 1980 report by the Institute of Laboratory Animal Resources of the National Academy of Sciences/National Research Council which showed a 40 percent reduction in the use of laboratory animals from 1968 to 1978.

Nevertheless, the use of laboratory animals remains absolutely essential in the drug and device industry. Alternatives such as in vitro testing, mathematical modeling and computer programming can be helpful adjuncts, but they cannot at present serve as substitutes for the use of animals to help show the possible effects of new drugs and devices on humans.

NETWORK OF PROTECTION

A network of laws, regulations and groups already is in place to ensure that laboratory animals are treated in a humane way.

Foremost among these protections is the Animal Welfare Act of 1966, as amended by the Animal Welfare Act of 1970 and the 1976 amendments to that statute. Among other provisions, the law regulates the transportation, housing, care, handling and treatment of animals used for research purposes, and requires that they receive humane treatment.

The FDA also has adopted regulations to assure proper facilities and treatment for laboratory animals, as part of its Good Laboratory Practices Regulations issued in 1979.

In addition, the American Association for the Accreditation of Laboratory Animal Care helps to ensure that public and private laboratories maintain the highest standards of care for animals. As of December 1979, there were some 378 accredited institutions representing medical schools, veterinary schools, pharmacy schools, hospitals, U.S. government laboratories, pharmaceutical companies and other research laboratories.

A laboratory is accredited by the association only after its inspectors tour the facility and a council of peers, after reviewing their report, concludes that the laboratory is in compliance with the National Institutes of Health "Guide for the Care and Use of Laboratory Animals."

Accredited laboratories submit annual reports on the condition of their animal facilities to the association, which also re-inspects the laboratories at least every three years. The council of peers reviews all the reports to determine whether the association should continue to fully accredit a laboratory, should grant it probationary accreditation or should withdraw accreditation.

MANDATED ANIMAL TESTING

Much animal testing is mandated by government regulation. In the pharmaceutical industry, every drug is required by the FDA to be tested in animals before it may be administered to a human.

Currently, there are no alternatives to toxicity testing in animals mandated by the FDA for new drugs. The whole animal, its chemistry and physiology, is needed for such testing and no substitute has yet been devised that provides comparable results.

FDA regulations provide that a manufacturer may not use a new drug on humans until it has conducted two kinds of studies on two animal species. The basis for the regulations is obvious: to ensure the safety of the people who first receive a new drug.

One of the tests required by the FDA is an acute toxicity study that grossly measures the toxicity and overt effects of a substance. These studies are used to determine the LD-50 — lethal dose for 50 percent of the animals tested — as well as the maximum tolerated level at which a drug has no lethal effect. Only single doses or closely spaced repeated doses of a drug are given in these tests.

The other tests required by the FDA are subchronic studies, which involve repeated dosing over two to four weeks in two species. Among other things, these tests show the biological effects that occur with repeated dosages of a chemical; the effects due to accumulation of a substance; the relationship between age and drug effects; metabolic changes caused by a drug substance; drug effects on the immune system; and distinctions between drug effects and spontaneous disease.

Under FDA regulations, only after these acute toxicity and subchronic tests are completed may a compound be given to humans for one to three days. Longer human studies must be supported by longer animal studies: to test a drug in humans for a month, studies in animals must first be conducted for one to three months; for three months in humans, up to six months in animals; and for three months or more in people, as much as 12 months or more in animals.

Of necessity, some drug testing in animals requires that the animals be destroyed. This happens in order to assure the safety of such products as polio, measles and rubella vaccines, as specified by FDA regulations. A sample from each batch of these vaccines is injected into the brain and spinal cord of monkeys. The surviving animals are sacrificed and examined to make sure that the neurovirulence of the vaccine does not exceed the standard set by the FDA. The destruction of the animals, as unfortunate as it may be, does not seem too high a price to pay when measured against the enormous benefits provided by the vaccines in eliminating disease.

All of the animal testing required by the FDA and other government agencies may not be necessary, however. The regulations of these agencies should be reviewed to determine whether, in light of modern technology, all required animal tests are useful in developing data relevant to human toxicity. A careful examination of the batteries of animal tests mandated by federal agencies could well lead to a reduction in the numbers of animals sacrificed each year, without any loss in valuable scientific data.

ANIMAL TESTS

Though alternative methods constantly are being sought, animal testing still is the best way to attempt to determine the effects of a new drug on humans.

The major goal of toxicological studies in animals is to determine the effects produced by a drug or medical device on the function and structure of the organism.

Data from animal studies are used to determine the toxicologic action of the product; dose response relationships; sex differences in response; the reversibility of the effects; the degree to which tolerance develops; and long-term effects of implanted devices. This information is used to assess human benefits and risks and identify adverse effects that may warrant special monitoring or precautionary measures during human testing.

As helpful as animal tests are, there still are limitations on extrapolating animal toxicity data to humans. Animal studies can predict neither drug effects peculiar to an individual nor toxicity unique to humans. Toxicity in a certain species, moreover, may simply reflect a drug effect peculiar to that species. In addition, animal studies cannot prove the safety of any drug or device and are not a substitute for human testing. The real value of an animal toxicology study is that it provides a reasonable means of predicting and characterizing possible adverse effects in humans.

Because animal studies only show possible effects in humans, are expensive and time-consuming, alternative testing methods always are being sought and are used when available. Unfortunately, most alternative procedures are less valuable than animal tests for predictive purposes and can be used only as adjuncts to these studies. Only one example could be located of an in vitro test that can totally replace an animal study — the Limulus Amoebocyte Lysate (LAL) pyrogen test, which is a less expensive and more reliable test for pyrogens than the mandated rabbit test.

ALTERNATIVES

The current effort to replace long-term carcinogenicity testing in animals with mutagenicity cell culture techniques reflects the general desire to find alternatives to animal testing. Cell culture techniques are cheaper, quicker and do not involve animals, but the results of such tests are of limited value.

Because all living organisms depend on the integrity of their genetic material, the interaction of a chemical with such material in a cell culture frequently is considered applicable to all forms of life, including man. This generalization, however, does not hold up. Cell culture techniques are so diverse phylogenetically, biochemically and methodologically that they often are irrelevant to assessing human risk. A positive response in a cell culture test establishes genetic activity under the conditions of the experiment, but such a result, standing alone, does not indicate what will happen in humans.

Genetic alterations in mammalian cells are thought to cause cancer, induce fetal loss, result in birth defects and cause neurological and metabolic diseases known to be genetic in origin. The finding that a chemical causes mutagenic activity in a cell culture test does not, however, establish that such activity will take place in a whole animal or that any adverse effects will occur in the animal. Such a conclusion can only be obtained from animal studies conducted under realistic conditions.

Medical scientists have developed in vitro tests that are used for very specific and restrictive inquiries. In vitro bacterial tests of mutagenicity, for example, may help to select one drug from many that has the least potential for causing mutations. But such screening tests cannot at present replace animal testing to help determine the safety of a new drug for humans.

The use of mathematical models and computer programs also have severe limitations. These methods must be based on what has already been learned about existing compounds and cannot accurately and completely predict the toxicity of new compounds. So far, only very simple examples have been subject to modeling — and with limited success. Like in vitro testing, the use of modeling can be a helpful adjunct, but it cannot serve as a substitute for animal testing to point out the risks of a new drug on humans.

Several efforts are underway to develop better alternatives to animal testing. The Cosmetic, Toiletry and Fragrance Association has given $1 million to finance a Center for the Development of Alternative Methods at the John Hopkins University. The American Fund for Alternatives to Animal Research has awarded a three-year grant to the Department of Pathology at the Medical College of Pennsylvania to develop alternatives to animal testing. In addition, the New England Anti-Vivisection Society awarded a $100,000 grant to Tufts University School of Medicine for the same purpose, and Revlon and Avon each has put up $750,000 to find an alternative to the Draize rabbit test.

CONCLUSION

The PMA supports the search for alternatives to animal testing and encourages their use whenever appropriate. At the present time, however, drugs must be tested in animals to help determine their effects in humans as accurately as possible.

PMA companies comply with the highest standards of animal care. The drug industry condemns cruelty to animals and considers reprehensible any behavior that does not conform to NIH's "Guide for the Care and Use of Laboratory Animals." Indeed, the industry strives to improve the treatment of laboratory animals while working to advance scientific knowledge and human welfare.

PROGRESSIVE ANIMAL WELFARE SOCIETY (PAWS)
P.O. Box 1037, Lynnwood, WA 98036
Humane Education & Animal Care Center
(206)743-3845; 778-0681

STATEMENT OF JOHN HOSUM, ADMINISTRATIVE ASSISTANT, PROGRESSIVE ANIMAL WELFARE SOCIETY (PAWS), LYNNWOOD, WASHINGTON

I welcome the opportunity to present this statement for your consideration and inclusion in the hearing record on the subject of "Live Animal Research."

I present this in my capacity as Administrative Assistant of the Progressive Animal Welfare Society (PAWS), a non-profit, tax-exempt, humane organization formed in 1967 and supported by 10,000 members in all parts of the United States.

Since 1974, PAWS has been studying the practice of using animals for experimentation and, during the past two years, has been investigating the animal experimentation activities at the University of Washington in Seattle, one of the nation's largest research institutions and users of animals. I will discuss some of the findings of PAWS and conclude with recommendations for government action.

ANIMAL EXPERIMENTATION AT THE UNIVERSITY OF WASHINGTON

The Federal Freedom of Information Act and state public disclosure laws provide only limited documentation about how public funds are used for animal experimentation, and public access to publicly-funded laboratories is prohibited; even legitimate animal welfare investigators are only provided, at most, with restricted "red carpet" tours of select animal holding areas, and rarely are provided access to observe experimental procedures. Furthermore, simple English words are dropped in favor of unnecessarily unclear language: complicated Greek and Latin terms are used to describe medical conditions and medical "mumbo jumbo" is used for official descriptions of experiments on animals; this use of unclear language is a "power play" over the public by the scientific community.

Despite these inhibitions, during the past two years PAWS has been investigating the use of animals for experimentation at the University of Washington in Seattle, one of the nation's largest research institutions and users of animals.

A review of "Project Summary Progress Reports," obtained from the National Institutes of Health under the provisions of the Federal Freedom of Information Act, revealed that experiments using animals at the University involved repetition, suffering, waste of animal life, insignificant results, and waste of taxpayer dollars. For example:

- A series of experiments were conducted on anesthetized and unanesthetized cats to observe the effects of brain damage on their ability to breathe;
- Monkeys' ability to chew was studied before and after portions of their brains were damaged;
- Unanesthetized dogs were subjected to lung injury, and groups of the dogs were killed at 24-hour intervals;
- Nine monkeys, conditioned to drink alcohol, were observed in different social situations to study the effect on their boozing;
- Four baboons were confronted with a live snake to study the effect of fear; a similar fear-response experiment was performed on four primates, using hunger and electrical stimulation.[1]

Rather than being unusual exceptions, the above examples are typical of the thousands of experiments reported. Since some 40,000 different animals are used annually at the University, the amount of suffering and waste of animal life and tax dollars is tremendous.

The University of Washington has consistently denied PAWS access to its primate research facilities, as well as other areas, regardless of individuals having satisfied health regulations. In addition, minutes of the University's Animal Care Committee meetings, as well as a listing of locations on campus where animals are kept and used for experimentation, were denied by the University, and were released to PAWS only after a lawsuit was filed this year in King County Superior Court to obtain the information.

The minutes revealed that the Animal Care Committee, composed of University officials, was not a functioning committee acting as a "watchdog" to provide protection and humane treatment for experimental animals, as the University had been claiming. Only 14 meetings were held from 1975 through June, 1981, and the minutes revealed no specific review of individual projects or use of animals during experimentation. Instead, the major concerns expressed in the minutes were concern about pending Congressional bills that might inhibit animal experimentation, concern about the advantages and disadvantages of releasing information requested under Washington's public disclosure laws, and concern about how to better convey an image to the public of humane treatment and important research.[2]

The accompanying brochure, "Animal Experimentation," further summarizes some of the findings of PAWS about experimentation at the University of Washington, and is intended for inclusion in the hearing record.

RECOMMENDATIONS FOR GOVERNMENT ACTION

Animal experimentation survives today and is allowed to flourish, unregulated, because the actions of the scientific community go unquestioned and unchallenged.

To meet the Subcommittee's goals of encouraging alternatives to painful animal testing whenever possible and, in all cases, to make sure that live animals are not subjected to torture and cruelty, Congress must be in a position of control over experimentation on animals and the public must be in a position to monitor experimentation.

I firmly believe that if the public knew, if they were allowed to know, and if they were allowed to see, animal suffering in laboratories and waste of public funds would not be tolerated.

To help meet the Subcommittee's goals, the following suggestions are offered for consideration. Although these suggestions are moderate in nature, I believe they would be of significant benefit.

1. OPEN MEETINGS AND PUBLIC REVIEW

The public should have the right to monitor the meetings and actions of boards having authority to approve research projects involving public funds for animal experimentation. Also, these boards should have equal representation by lay persons, including persons from established animal welfare/humane society organizations.

2. EASILY UNDERSTOOD LANGUAGE

Applications for public funds should use simple English words to describe proposed experiments using animals, and applications should contain an evaluation of the merit of the proposed experiment, including reasons why the desired information could not be obtained by other means.

Similarly, intermediate and final reports describing approved projects should be written in simple English words.

As an example of easily understood language, the following title of a report about experiments with mice, "Psychoneuroendicrine Influences On Immunocompetence And Neoplasia," could have also been written, "Stress As An Influence On The Incidence Of Cancer."[3]

3. AMENDMENTS TO THE ANIMAL WELFARE ACT REGARDING COMPLIANCE WITH STANDARDS AND INSPECTION OF PROPERTY

Two sections of the Animal Welfare Act (Title 9, Subchapter A, Part 2, Sections 2.100 and 2.126) should be amended to allow for government regulation of experiments and to provide for public access to laboratories.

Government regulation would be facilitated by deleting the following part of Section 2.100(a) which reads, "Provided, however, That nothing in these rules, regulations, or standards shall effect or interfere with the design, outlines, guidelines, or performances of actual research or experimentation by a research facility as determined by such facility."

Public access to laboratories would be facilitated by adding to Section 2.126 that the Administrator of the Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, shall authorize, upon request, representatives of established animal welfare/humane society organizations to inspect facilities under the provisions of Section 2.126. Representatives, so authorized, would submit reports of suspected infractions and problems to APHIS for review.

These regulated additional inspections would help APHIS in performing its responsibilities under the Animal Welfare Act. Additionally, the general public would be comforted in knowing that animal welfare/humane society organizations are allowed access to laboratories.

4. ADEQUATE FUNDING FOR INSPECTIONS

To ensure protection for laboratory animals, the Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, must be adequately funded by Congress to enable it to inspect laboratories, as needed, to ensure compliance with the provisions of the Animal Welfare Act.

In 1980, APHIS ran short of funds and ceased its inspection program during the last eight weeks of the fiscal year. In 1981, according to Dr. David Mitchell, the APHIS Area Veterinarian in Charge for Washington and Alaska, only one inspection of each facility was to be made, due to limited funds, unless a complaint was received.[4]

References

1. Copies of cited "Project Summary Progress Reports" available from PAWS.
2. Copies of Animal Care Committee Minutes available from PAWS.
3. Riley, Vernon, "Psychoneuroendicrine Influences On Immunocompetence And Neoplasia," Science 212:1100, 5 June 1981.
4. Personal conversation, 20 April 1981.

The Use of Animals in Medical Research and Testing
Statement of Herbert Rackow, M.D.
To: The Subcommittee on Science, Research and Technology

Animals are important tools for research in medicine and the biological sciences. Physicians and scientists are rightly concerned about the restriction of future use of animals in these fields. Certainly, in the past, a vast amount of knowledge has been obtained which did depend upon using live animals as research tools. Nevertheless, there are ethical concerns about this use of animals. These are concerns which the public insists must now be considered. The public is saying that an animal is more than a tool.

Today, because of a growing humane awareness, the public is asking that there be constraints on the use of animals for research and testing. Any constraint, no matter how small, must interfere with research and testing to some degree. Any use of experimental animals, no matter how benign, probably must entail some degree of unpleasant stress. It will be a wise and humane society that will not permit the imposition of more stress to animals than that which man could reasonably endure, while at the same time, only interfere with science to an insignificant degree. The public is saying that they are willing to postpone gaining the knowledge which might be obtained through stressful animal experimentation. This does not mean permanently closing the door to such knowledge. Newer approaches using tissue culture, organ culture, non-invasive testing, and as yet undiscovered methods, will open doors that should for now remain closed because the present ethical costs of opening them are too great.

The Subcommittee is examining excessive, unnecessary, uneconomic or inappropriate use of animals in current practice. Much of current practice is current only because of tradition. For example, if a proposed treatment for a serious disease found in man only were to be investigated, the experiment would be designed to use the minimum number of subjects needed to determine the efficacy of the treatment. This is commonly done using matched pairs of subjects, one in the pair being a control, the other receiving the treatment. As soon as a statistically significant difference in the outcome becomes apparent, the experiment stops. An excessive number of experimental subjects is not needed, nor is there an excessive number of untreated, seriously diseased controls. This type of design is rarely used in animal experimentation. Instead, a large number of animals simultaneously receives the proposed treatment, and is compared to a similar large number not receiving the treatment. Both types of experiment produce useful knowledge, but one is designed to use the minimum number of subjects, the other not so designed, because the subjects are animals. It is appropriate that a National Center for Alternative Research review grant proposals for research or testing using animals, so that animals be given the same consideration as man, in terms of avoiding the use of excessive numbers of subjects.

Unnecessary use of animals is also a value judgment. The scientific literature is filled with reports of research of trivial value which has required the use of many animals, often in stressful experiments. These reports were necessary to support the careers of scientists who had to "publish or perish". But these scientists stood, not on the "shoulders of giants" but on the painfully stressed bodies of animals. Similarly, we have animal testing of dozens of different household detergents and hundreds of different cosmetic products. It is highly questionable that more such trivial additions, based on stressful testing on live animals, is really necessary.

It is extraordinarily difficult to predict tomorrow's value of today's experiment. Therefore, in general, scientists should be free to look in any direction. Most often, the price paid is the scientist's own time, his own reputation and his own career. However, if live animals are used, then the animals also pay, and through these animals, society pays, because of its ethical responsibility. On this basis, society has a right to decline to pay. On this basis, if society judges the purpose of the experiment to be trivial or frivolous, then it has a right to say that live animals should not be used in such an experiment. Even if a proposed experiment is thought to be of great importance, if it subjects animals to great stress, then society has the right to say it should not be done.

It is inappropriate to use live animals in research or testing where alternative methods already exist, or where alternative methods appear to be ripe for development. It is appropriate that the proposed Center for Alternative Research consider this point in evaluating proposed projects.

The Animal Welfare Act should be amended to require humane treatment of animals during experimental procedures, including postoperative care, even if this interferes with the purpose of the experiment. The standard of humane treatment should be that which man could reasonably be expected to endure. This would permit, for example, surgical procedures under proper anesthesia, with appropriate postoperative care.

At present, academic institutions must have institutional review boards evaluate experimental projects using human subjects. These boards consist of scientists not connected with the project, but knowledgeable in the field, plus a lay person from the community, for the protection of the experimental subject. It would be appropriate that in all proposed experimental projects that use animals as subjects, a representative selected by humane societies be on the institutional review board. Similarly, representatives of the humane community should sit on N.I.H. project evaluation committees, to pass on the humaneness of all projects involving the use of animals.

Herbert Rackow MD

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October 9, 1981

Representative Doug Walgren
Chairman
Science, Research and Technology Subcommittee
Committee on Science and Technology
U.S. House of Representatives
Suite 2321, Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Walgren:

The Scientists Center for Animal Welfare submits the following statement for the record of the hearings on the use of animals in medical research and testing.

Our purpose in submitting testimony is not to promote one or other piece of pending legislation, but is to suggest some practical approaches to the issues addressed. These are: 1) the need for all vertebrate species of laboratory animals to be included under the current legislation, 2) improved procedures for peer review of animal experimentation, 3) a broader definition of "alternatives" and 4) training needs.

1) Expansion of Existing Legislation to Include All Vertebrate Animals

The Scientists Center for Animal Welfare endorses a broadening of the scope of the current Animal Welfare Act to include not only rats, mice and farm animals, but also all vertebrate animals maintained and used in biomedical research. These animals are not included in the legislation as it stands today and we regard this as a serious deficiency. It has been estimated by the US Department of Agriculture (USDA) that only 4 percent of animals are currently covered by the Act,which represents a fraction of the total utilized. It is important, therefore, to recognize that additional funding needs to be given by Congress to the USDA in order to carry out this essential function in its current form let alone in any expanded version.

2) Improved Procedures for Peer Review

The existing peer review system which assures the humane use of animals in research needs to be revised and improved. Decisions with respect to an investigator's protocol for animal experimentation are reviewed at the institutional level by the Animal Care Committee or its equivalent. Review at the central level is made by the funding agency (Study Sections and Advisory Committees of the National Institutes of Health, Review Panels of the National Science Foundation, and Review Committees of other funding organizations). In most cases, however, the primary function of central level review is to consider the scientific merit of the proposal and it does not address animal usage concerns. Frequently, experts in laboratory animal medicine and the techniques of animal experimentation are not members of such committees, so that animal subject protocols may not be adequately reviewed.

Issues to be addressed at both the institutional and central levels of review include: balance between benefit from expected results of experiments and the ethical cost to the animals used; selection of appropriate animal models for the proposed studies; experience of the investigator with the proposed animal procedures; availability of the species to be used in the numbers required; realistic estimate of the numbers of animals needed; adequacy of anesthesia, analgesia and post-procedural care for all invasive experimentation; adequacy of animal facilities; and timely termination of an experiment with appropriate methods of euthanasia.

At the institutional level of review, the Animal Care Committees should be convened on a regular basis and proper records must be kept of their deliberations. These committees should be composed not only of experts in the field of scientific investigation and veterinarians knowledgeable in laboratory animal medicine, but also could include laboratory technicians, ethicists, members of the lay community, and representatives of animal welfare organizations. A broader representation of viewpoints from the entire community would enhance public understanding of scientific investigation and would be a step towards public accountability and credibility for scientists who use animals in research.

At the central level of review, some system similar to that already practiced by the Veterans Administration could be instituted and would be beneficial. This review process requires that a detailed Animal Subjects Statement and Approval Form for Animal Studies accompany each research proposal being considered for funding. In addition, a group of experts in the research and service aspects of laboratory animal medicine convenes in person or by mail to provide a written summary of the animal subjects protocol. This review is completed prior to the scientific merit review and is provided with the application to the merit review group. In this manner, animal care concerns are fully considered beforehand and the length of time for completion of the review process is unchanged.

3) Broader Definition of "Alternatives"

If we are to promote the concept and practice of "alternatives", the thrust of much of the proposed legislation, then we must teach scientists the meaning of this term in its broadest context. Although the term has been used in various ways, to some people it means only the total replacement of animals with nonanimal substitutes. This definition is too narrow. The term should be used to encompass the three "Rs" of Russell and Burch, namely, replacment, reduction and refinement, as these constitute the fundamentals of humane animal experimentation. Thus "alternatives" should include: reduction in the sentience level of the species selected for experimentation (for instance replacement of a vertebrate animal with an invertebrate where possible, or a nonhuman primate with a mouse); reducing the invasiveness of the experimental procedure and thereby minimizing the amount of pain involved, and refinement of the techniques to minimize stress or pain (such as providing optimal postsurgical care or eliminating use of negative reinforcement for behavioral training). Together, the concept of "alternatives" includes any action on the part of the investigator that will reduce the ethical cost to the animals being used in experimentation.

The Scientists Center for Animal Welfare agrees with the concept of promoting alternatives within animal experimentation, and we accept the fact that whole animal experimentation is and will continue to be essential. Attempts to fund more nonaminal experimentation will not, we believe, be the most propitious route to achieve greater acceptance of alternatives. However, if the principles of replacement, reduction and refinement are implemented as alternatives, then both needs (for animal experimentation and for humane considerations) will be met.

4) Training Needs

More could be done to meet the needs addressed above if scientists received better training in the practices of animal maintenance and experimentation as well as in the concepts of using alternatives. We believe that funding should be provided at the local, state and federal levels to develop courses for undergraduates, graduates and post-graduates attending colleges and institutes of higher learning. Both practical and philosophic aspects of animal experimentation should be taught. Practical courses should include: selection of appropriate species for the proposed studies; techniques for animal handling and specimen collection; techniques for surgery and postoperative care; how to select and administer the proper anesthetic or analgesic for the species used; how to care for the animal subjects throughout the experimental period; how and when to terminate an experiment; and techniques for administering painless death to the animal at the time of sacrifice. Some courses on "Ethics and Animals" are already part of the curriculum at a few colleges and veterinary schools. The Scientists Center for Animal Welfare believes that courses addressing bioethical issues concerning man's responsibilities regarding laboratory animals are appropriate for all students entering a career in the biological sciences and should be included as a standard component. In the 1960s and 1970s the sensitivity of scientists toward human experimentation became enhanced and specific training was incorporated into the medical school curriculum which addressed these issues. We hope that the 1980s will see a similar pattern emerging for animal experimentation.

Training courses are needed for the following classes of persons involved in decision-making regarding the humane use of animals in experimentation: laboratory technicians; biomedical students; professional scientists; and members of the following groups: Animal Care committees at research institutions, committees that make funding decisions on research proposals involving animal experimentation, committees that accredit the animal research facilities of public and private institutions and companies; and inspectors for the USDA who visit research institutions to determine compliance with federal laws.

In summary, we propose that attention be given to expanding the current legislation to include all vertebrate species used in biomedical research, enhancing the review for animal concerns by Animal Care committees and other expert panels that review research proposals, and expanding the training of personnel who are in a position to influence the application of "alternatives" and, in the final analysis, the humaneness of animal experimentation.

Sincerely,

FBarbara Orlans

F. Barbara Orlans, Ph.D.
President
(On behalf of the Board of Trustees)

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SCIENTISTS GROUP FOR REFORM OF ANIMAL EXPERIMENTATION
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The Scientists' Group for Reform of Animal Experimentation is composed of physicians, veterinarians and research scientists. We are concerned with the ethical problems connected with animal experimentation. We recognize that all of us, not scientists alone, must decide the price in suffering we are willing to pay, not only for frivolous objectives like new detergents and cosmetics, but even for more rapid progress of science and medicine. We feel that those who use experimental animals, either in their training or in their work, have a special responsibility, not to use them wastefully, and to minimize the suffering of those that are used. Any approach to the problem must be based on the recognition that to the extent that animals are useful as models for humans, they are also like us in their ability to suffer. Extrapolation works in both directions: To the extent that it is valid from animals to man, it is valid also from man to animals.

The Scientists' Group would like to address all five areas to be examined by the Committee in these hearings:

Excessive, unnecessary, uneconomic or inappropriate use of animals in current practice

The use of animals from pounds or shelters for testing and research should be examined. Because the price per animal is lower, because the animal is "cheaper", there is a mistaken notion that the practice is economical. It is not only not economical, but it results in the use of excessive numbers of animals, and often in inferior research. When the experimental material is cheap, it is often simpler to try out rather than to think out an experiment.

Pound animals may be cheap, but their use is not economical. For example, according to data supplied by the New York State Department of Health, on animals requisitioned from pounds in 1977, Bristol Laboratories reported that 59 percent of the 538 dogs, and 75 percent of the 163 cats were "unsatisfactory". Of those that were used, we do not know how many contributed to misleading results - a waste of time and effort, and a direct cause of the use of more animals, in more experiments, to explain the discrepancies that come to light later.

Several States now have passed laws prohibiting the requisitioning or the release of animals from pounds or shelters to dealers or to laboratories. The laws generally provide that the animals must be adopted or euthanized. But this does not prevent laboratories from obtaining animals from pounds in other States, either directly, or via dealers. Federal legislation to prohibit the interstate shipment of such animals to dealers or to laboratories, would effectively limit the use of pound animals in laboratories, and would encourage the use of purpose bred animals. Such animals would be used more sparingly, and fewer would be needed to obtain results with the same statistical significance.

Of the unnecessary and inappropriate uses of animals, one that has been questioned by those within the field itself, is the use of animals in certain behavioral studies. While the impetus for this criticism may have been the incredible cruelty involved, the work has also been criticized on purely scientific grounds. As an example of this type of research, consider the production of "learned helplessness" in animals: This work first used dogs as experimental subjects. The dogs were given electric shocks until they learned to jump over a barrier to avoid them. Conditions were then arranged so that the dog could no longer escape the shock by jumping over the barrier. The result was called "learned helplessness". The dog gave up trying, and simply lay on the floor, whining, while being continually shocked. The authors of this report state that between 1965 and 1969, "the behavior of about 150 dogs that received prior inescapable shock was studied." Further, that the effect has been reported in cats, rats, mice, birds, primates, fish and man, as well as in dogs. The authors remark that: "The learned helplessness effect seems rather general among species that learn". We may well ask: "Are these experiments necessary?"

Dr. Alice Heim, one of Britain's most distinguished psychologists, in an address in 1978 to the British Association for the Advancement of Science, criticized certain experiments in behavioral psychology on scientific grounds. She then went on to say: "With respect to animal experimentation, two issues arise: First, how important and informative are the ends? Secondly, when given ends are in fact deemed worthwhile, to what extent is it permissible to use means which are intrinsically objectionable?" - - "What do I mean by the phrase 'intrinsically objectionable means'? I have in mind those experiments which demand the infliction of severe deprivation, or abject terror, or inescapable pain. - - " " - - it is abundantly clear that such experiments involve the subjects in prolonged and intense suffering - but 'suffering' is not, of course, a behavioural concept. One can read endless accounts of such work and very rarely come across the word 'suffering' or 'disappointment' and literally never meet the word 'torture'. (Yet surely torture may be defined as the infliction of severe pain, often as a means to an ulterior end)."

This type of experiment leads us to the second area to be examined by this Committee: Ways to promote more humane and appropriate use of animals, including alternatives to animal use where possible

Several symposia have been held on the use of alternatives, and several books on the subject have been published. But again, it is unnecessary to go further than the work done in the field of behavioral psychology, for examples. Certain remarks of Dr Heim's are appropriate. She says: " - - I should like to see the experimental method used in psychology, wherever this is practicable without distorting the basic material; and I believe it to be practicable in a great many cases. Research on addiction? - there are thousands of ready-made Subjects to be found among human alcoholics and drug addicts. Research on the effects of smoking? - again, thousands of people who brave these risks, voluntarily, pleasurably and extravagantly. Research on brain tumours? - the patients are to be found and many of them can offer useful introspection. Research on neurosis? - surely it is more valuable to work with disturbed human beings who seek help than to render cats and other animals 'experimentally neurotic'; then try to 'cure' them; and then try to draw an analogy between these animals and the immensely more complex homo sapiens."

Incentives for development of more and improved alternatives to animal use, including those suggested in pending legislative proposals is the third area to be examined.

Such incentives have always existed. The basis usually has been convenience, or economy, or sometimes, necessity. A good example is the development of an in vitro method for cultivation of polio virus. Originally, polio virus was studied in live monkeys. But it was not possible to develop a vaccine under these conditions, because a virus preparation obtained in this way had too many impurities. In 1949, it was demonstrated that polio virus could be grown in cell culture. This work, which won the Nobel prize, made it possible to develop a polio vaccine using monkey kidney tissue culture. But importing large numbers of live monkeys to obtain sufficient kidney tissue was very expensive. A technique using human cells is now being developed. This could eliminate the need for monkeys, altogether, in the production of polio vaccine.

It has been claimed that the incentives for development of alternatives are so great, from the economic standpoint, that there is no need to provide further incentives. It is true that most alternatives are not only more convenient, more rapid and more economical than the use of animals. But in spite of this, even when alternatives are available, some research and testing still uses animals in the same way as always, because the work has traditionally been done this way, and because this is the way with which the investigator is familiar. Moreover, a further incentive needs to be added - the incentive to develop alternatives for purely humane reasons.

Where a test method or research procedure is inherently inhumane, the development of a valid alternative, even of one which is no less costly and no less time-consuming, should be encouraged. If it is already available, its use should be mandated.

Several pending bills address the problem of encouraging the development and use of alternatives. The provision, in H.R. 556, that the use of approved alternatives be mandatory, is important. Its acceptability will depend on the criteria used for approval of alternative methods. Creating a Center for Alternative Research, as provided in the bill, is a good approach to establishing proper criteria, by making known those alternatives that already exist, and by evaluating these alternatives. The provision that the Center provide training in the use of alternatives, and make grants for the development of new alternatives, is an effective way to stimulate research in this area. It should be pointed out here, that any legislation to encourage the development of, and mandate the use of approved alternatives, should use the term alternatives to mean any procedure that: replaces the use of animals, or reduces the number of animals used, or refines an existing procedure so as to lessen the stress on the animals used.

Alternatives replacing the use of animals will not be available in all instances. Where animal are still used, there should be a limit to the permissible pain or distress. Amendment of the Animal Welfare Act, as provided in the Schroeder Bill, H.R. 4406, would be a significant step in the right direction. For effective implementation, the bill should require that responsible representatives of humane groups be included in the animal care committees.

The fourth area to be examined by this Committee, Responses from academic, private and public research institutions to problems raised by these proposals, calls for some comment. Predictably, there has been considerable objection. No group wants to be regulated. Research scientists, in particular, wish to be unfettered. And rightly so. Research thrives best when new avenues that open up can be followed freely. This does not mean that sloppily designed experiments, and the careless use of resources will not lead to a waste of time and money. There will always be a certain amount of this. But in research using animals there are also other considerations. Here, we are not dealing with things. We are dealing with sentient beings. It is not just a question of waste, it is a question of suffering As with experiments with human beings, it is up to society, not scientists, to make the rules. For this reason, all Institutional Review Boards, and all Peer Review Committees, should include representatives of humane groups.

Organized science has always opposed any new restrictions on the use of animals, including those provided for in the Animal Welfare Act, when it was before Congress. In the past, individual scientists who have wanted to speak up on the side of protection for experimental animals have usually been intimidated or prevented from doing so, by peer pressure. More recently, many have banded together to act on their concern for the humane use of experimental animals, and acknowledgment of this concern by scientists is acquiring the stamp of respectability within the scientific community.

The last area to be examined by the Committee is: Areas in which animal-based research or testing remains crucial to protection of human health

Testing of new household products and of new cosmetics should not be included in this area, since these are economic rather than health problems. Development of new household products and new cosmetics is not essential to human health. Development in these areas should be strictly contingent on the use of indisputably humane methods.

The areas in which animal based research remains crucial to human health will continue to diminish in number and in size, with increased use of alternatives. But from our present knowledge, we must assume that certain types of physiological and surgical research will always require the use of the intact animal. The final stages of drug testing, also, will probably be, first on animals then on man. In testing drugs on patients, care is taken that as few people as possible be put at risk to obtain the required information. The same should be true in the preliminary testing with animals. The patients on whom drugs are first tried are very closely observed for untoward effects, and are not allowed to suffer distress. The same should be true in the preliminary testing with animals.

Marjorie Anchel

Marjorie Anchel, Ph.D., Director

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NONANIMAL RESEARCH METHODOLOGIES—PROCEEDINGS OF A SYMPOSIUM, SPONSORED BY THE GEORGE WASHINGTON UNIVERSITY ETHICS AND ANIMALS SOCIETY, WASHINGTON, D.C., FEBRUARY 18, 1981

EDITOR'S PREFACE

On February 18-20, 1981, the National Institutes of Health sponsored a long-awaited symposium, which was entitled "Trends in Bioassay Methodology: *In Vivo, In Vitro,* and Mathematical Approaches."

The conference was held by the National Institutes of Health in response to a congressional demand for assessment of the current outlook for developing and using alternatives to animals in research and testing. Congress in turn was responding to public pressure for enactment of legislation promoting development and use of alternatives, notably the "Research Modernization Act," designated H.R. 4805 in the ninety-sixth Congress and H.R. 556 when reintroduced in the ninety-seventh Congress.

When the NIH-sponsored symposium was finally announced, there was disappointment among some members of the scientific and animal rights/welfare community, who found the announced title and program slightly but significantly out of focus. The subject was no longer the state of the art of alternatives, as had been anticipated, but rather a wide-ranging review of bioassay methodology. This shift was seen by those concerned about it as a diffusion of attention away from alternatives as a concept and array of techniques urgently in need of encouragement, development, and application.

Accordingly, the George Washington University Ethics and Animals Society undertook to offer those attending the NIH symposium a supplementary session of presentations that would put alternatives back at center stage. With the advice and help of Dr. Andrew Rowan, Associate Director of the Institute for the Study of Animal Problems, the Society developed a program entitled "Nonanimal Research Methodologies: A Symposium," which was presented on the evening of February 18 at the end of the first day of the three-day NIH meeting. The contributors to the program were DR. ROWAN; PHILIP NOGUCHI, M.D., Chief, Cell Biology Branch, Division of Biochemistry and Biophysics, Bureau of Biologics, Food and Drug Administration; DAVID BRUSICK, Ph.D., Director, Department of Molecular Toxicology, Litton Bionetics, Inc., Kensington, Maryland; and TOM REGAN, Ph.D., Professor, Department of Philosophy, North Carolina State University at Raleigh. Dr. Rowan and Dr. Regan spoke as advocates of alternatives in general; Dr. Noguchi and Dr. Brusick described their experience and understanding of particular alternative methods of research and testing.

Although the program had originally been scheduled for presentation during two evening sessions, the contributors were faced with severe time constraints when a change in the NIH symposium schedule forced compression of their presentations into one evening. Radically shortened presentations, strictly limited question-and-answer periods, and split-second chairing by Dr. Rowan resulted nonetheless in a complete program. It was attended by a standing-room-only audience of over eighty, who crowded into a lecture room at George Washington University after an already full day of NIH proceedings.

The George Washington University Ethics and Animals Society is particularly pleased that the program, although relatively small, nevertheless achieved balance and scope. Dr. Rowan, representing a private study institute, presented a clarification and explication of the fundamental concept of alternatives; Dr. Noguchi, who works in a government setting, described progress in his laboratory in developing a particular alternative method for use in cancer research; Dr. Brusick, from private industry, described the advantages alternatives offer in the testing and marketing of chemicals and pharmaceuticals; and Dr. Regan, a university professor, told why vigorous promotion and application of alternatives is a moral requirement for our entire society to consider. This volume is a record of these presentations and the discussion engendered by them.

ANDREA POSNER
Editor
September 1981

Synopsis of the Symposium Presentations

"Nonanimal Research Methodologies: A Symposium" opens with Dr. Andrew Rowan's overview, "Alternatives to Laboratory Animals: Scientific, Fiscal, and Philosophical Considerations." Dr. Rowan talks about alternatives as a concept designating and embracing both an array of techniques and an "attitude of mind."

"What we are really talking about when promoting alternatives," Dr. Rowan begins, "is the technology of science," that is, techniques "that can be applied to a particular research problem or a particular safety evaluation problem."

In addressing alternatives as an array of techniques, he cites the "three Rs"—replacement, reduction, and refinement: "An alternative is any technique that can replace the use of animals altogether; can reduce the numbers used; or can reduce the amount of distress through refinement of the techniques used." We are given several examples of systems that have been identified as potential alternatives: gas liquid chromatography, mass spectrometry, computer mathematical modeling, microbiological systems, tissue culture ("the prima donna of the alternatives"), and special training and environments for laboratory animals.

To illustrate the possible confusion that may be hindering acceptance of alternatives, Dr. Rowan points to the familiar use in toxicology testing of large numbers of animals chosen for their "high fidelity" in resembling the human organism. There is evidence that "low fidelity" nonanimal test systems may be better discriminators of toxicity than animals are. And since the aim of toxicology testing is not to test substances on an animal that closely resembles humans, but (except where risk assessment is required) to discriminate between toxic and nontoxic substances, we are left with the implication that there should be more vigorous investigation of the nonanimal systems despite the familiarity and customariness of the use of animals.

Turning to the question of funding for nonanimal research methodologies, Dr. Rowan cites the relatively low amounts made available for alternatives, and shows that warnings against trying to "force the pace of development by just providing money" are misconceived. There has been, he reminds us, willingness in the past to provide vast sums to find a cure for specific diseases like cancer and diabetes. If the failure of some of these efforts is now invoked as a reason for withholding funding for alternatives, the wrong lesson has been drawn, because the crucial difference between finding cures for diseases and developing techniques for research has been overlooked: "Cancer research is an amalgam of ... four elements—intuition, critical analysis, luck, and available techniques," while specific alternatives are essentially a matter of development of new techniques alone. While no amount of money can purchase at least two of the four elements necessary for such enterprises as seeking a cure for cancer—luck and intuition—the development of new techniques "would certainly be well served by the appropriation of specific funds for specific research efforts."

The question of funding for alternatives is related to what Dr. Rowan considers the other essential aspect of the alternatives concept, an element lacking, he says, "at the NIH conference and from much of the scientific discussion of alternatives: a positive attitude and a commitment." Alternatives, he implies, will not simply appear in the unfolding of biomedical research; they must be actively sought out, and for this there must be not only funding but a "prepared mind." Many scientists, he observes, "are not comfortable with the commitment implied." Too many, unfortunately, "are still looking backward at what has gone before and not enough are looking forward to what might be—at least, not in terms of alternatives to laboratory animals."

Following Dr. Rowan's survey of alternatives as a many-sided phenomenon, Dr. Noguchi directs attention to the problem of cancer by describing his own introduction to the disease and his pursuit of an *in vitro* method of studying it. His presentation is entitled "Alternatives to Animals in Cancer Research: A Personal Experience."

Dr. Noguchi notes that "when one treats a patient in the hospital, and then participates in the autopsy on that patient, one quickly appreciates the inherent challenge of trying to understand the process of cancer." Dr. Noguchi is pursuing this understanding through studies of human cancer cells *in vitro*. He describes here a particular colon carcinoma cell line called WiDr. Dr. Noguchi points out to his audience that working with cancer cells requires verification of their tumorigenicity. But the disadvantages of the typical *in vivo* tumorigenicity test—false negatives, the need to immunosuppress the test animals, the need to maintain the animals, and variation in sensitivity among animals—make it clear, in Dr. Noguchi's words, "that development of a reliable alternative to an *in vivo* tumorigenicity test would certainly be a significant tool of cancer research."

Dr. Noguchi describes the development of such a test called the chick embryonic skin (CES) assay, in which normal CES tissue is cultivated *in vitro* to serve as a substrate for cancer cells being tested. The first published study on the CES system by Dr. Noguchi and his colleagues found it to be "at least as sensitive as the nude mouse in detecting cells that are derived from known cancers." The system is now under consideration as an acceptable alternative to *in vivo* tumorigenicity testing by both the Food and Drug Administration and the World Health Organization.

Subsequent to his symposium presentation, Dr. Noguchi also reported that his research group's most recent work shows that the CES system predicts not only *in vivo* tumorigenicity but also metastatic potential ("Tumorigenicity of Continuous Monkey Cell Lines in *In Vivo* and *In Vitro* Systems," *Proceedings of a Joint Meeting on the Use of Heteroploid and Other Cell Substrates for the Production of Biologicals, Developments in Biological Standardization*, in press). Finally, a group of investigators at The Ohio State University has published two reports showing that the CES assay can be used to replace nude mice in carcinogenesis studies [see *AACR* (American Association for Cancer Research) *Abstracts*, March 1981, No. 464 and No. 465].

Dr. Brusick's discussion, "The Use of Nonanimal Assay Systems for Detection of Potential Carcinogens," begins by focussing on the economic pressures that he believes will lead to general acceptance of alternatives to animal carcinogenicity tests. Dr. Brusick says there are three main problems with tests that use animals: performance, time, and cost. He describes a typical carcinogenicity study using rats, which spans about three years, "an extremely long time to have to wait to get ... material on the market." The actual cost of performing such a test is also formidable: $600,000 is the latest average figure. "The end result of these two problems," says Dr. Brusick, "is that only a few chemicals can be tested. This in itself is a detriment to society in that only certain types of chemicals are evaluated as potential hazards to man, when in fact many more chemicals should be evaluated."

From the scientific point of view, Dr. Brusick presents evidence for his observation that "the animal model, as a surefire predictor for what's going to happen in man, leaves a lot to be desired." Molecular toxicology, by yielding knowledge of the mechanisms underlying disease or toxicological phenomena, may, he says, enable better extrapolations to be made.

For the present, it is in the detection of carcinogens that Dr. Brusick sees the clearest and most immediately applicable advantage of the short-term *in vitro* test: "We think that probably most chemical carcinogens could be as easily detected in a group of [short-term] tests as in a whole animal test." However, he cautions that while the short-term test can detect, it cannot at present quantify, carcinogenic potential.

Finally, philosopher Tom Regan demonstrates that on rational, moral, and factual grounds, the vigorous pursuit and development of alternatives is an imperative for our society, one that we are failing to recognize or act upon.

Dr. Regan's presentation, "On the Ethics of Using Animals in Science,"* begins by examining the major arguments used on both sides of the question of the moral permissibility of animal experimentation. In the course of developing the case against both of two extreme opposing views on the scientific use of animals—the "Unlimited Use" and the "No Use" positions—Dr. Regan articulates a principle he believes satisfies rational, moral, and factual requirements where the two extreme positions and their various supporting arguments fail. This principle, called the Modified Innocence principle, states:

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*See note on p. 32.

> We are not morally justified in harming an innocent individual unless we have first conscientiously explored other alternatives and, having done so, are rationally justified in believing that harming the innocent is the only realistic way to proceed if we are to prevent comparable harm to many other innocents.

Since animals are innocent individuals, Dr. Regan concludes that scientific use of them that harms them but does not meet the requirements of the Modified Innocence principle is not morally justified.

Surveying the actual use of animals in science today, Dr. Regan concludes that "*at least most* of the uses ... that harm them are not morally permissible—are morally wrong." One example Dr. Regan cites is the LD-50 (median lethal dose) test. He says, "There are at least two reasons for believing these tests, which cause great harm to the test animals, will not prevent equal harm to many other innocents. First, ... it is often very clear long before 50 percent of the test animals have died that the substance [being tested] poses no serious threat to human beings. Second, the data obtained ... often are not reliable. And [so] ... we do not have good reason to believe that the harm done to the test animals will prevent equal harm to many other innocents."

It is Dr. Regan's view, then, that the onus of justification is upon those who would cause harm to animals for scientific purposes to show that such use is not wrong. One way to show this is to demonstrate that "all that reasonably could be done has been done" to develop alternatives to the use of animals.

In this way, Dr. Regan makes the case that the scientific community in particular and society in general have an obligation to support and carry out a maximum effort to develop and apply alternative research methods.

ANDREA POSNER
Editor

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OCT 27 1981

October 26, 1981

The Honorable Doug Walgren
Chairman, Subcommittee on Science,
  Research and Technology
Rayburn Building, Room 2319
Washington, D.C. 20515

Dear Mr. Walgren:

I appreciate the opportunity to provide the Subcommittee on Science, Research and Technology with information regarding areas in which animal-based research and testing have been effective and remain critical for the enhancement and protection of human health.

I would like to preface my remarks by calling the Subcommittee's attention to the fact that the vast majority of extramurally funded research in the School of Medicine at the University of California at San Francisco does not involve the use of laboratory animals. They are used in only about one third of extramurally funded projects. However, if we are to continue to make progress in improving both human and animal health and if we are to avoid exposing either human volunteers and/or patients to untested procedures, the continued use of animals in research and testing is essential.

Recently there has been a major attempt to promote the use of alternatives to the use of laboratory animals. However, some of those alternatives depended on animal use for development and continue to rely on limited use of animals. So it is often difficult to discriminate between animal use and the so-called alternatives. For example cell cultures are frequently promoted as alternatives to the use of animals. However, the cells used in cultures are frequently obtained from animals. Another example, that in fact uses a cell culture technique, is the production of monoclonal antibodies. Producing these monoclonal antibodies in cell cultures will probably replace a large number of rabbits that have been traditionally used for the production of antibodies in conjunction with biomedical research and testing. Because the antibodies produced in hybridomas are monospecific they are of much greater value than the wide variety of antibodies found in any animal serum. However, even though hybridomas are considered to be an in vitro system, cells must be obtained from mice to seed the hybridomas.

The original work that discovered the feasibility of producing monoclonal antibodies was performed in mice. This animal research has tremendous basic science and clinical applications. Probably over the next number of years most laboratory tests which require an antibody will be supplied in this manner. Also it is conceivable that these hybridoma techniques may be useful therapeutically. An antibody could be either radiolabeled or labeled with a chemotherapeutic agent and as a result might specifically be carried to a cancer and therefore be more effective in treating that cancer and less toxic to normal tissue. Some preliminary studies with these antibodies in the treatment of human cancer have been quite promising. They may also have value in designing the means to neutralize that portion of the immune system responsible for the rejection of transplanted tissue without affecting the remainder of the immune system which is responsible for protection against invading pathogenic microorganisms. However, to test these forms of therapy, living animals will have to be used.

Another alternative to animals, that is frequently promoted, is the computer. Various members of our faculty have done extensive work in computer simulation of biological and other systems. There is no doubt that computers can be very helpful tools in biomedical research. But there is no substitute for going into the laboratory and taking real data. Without data from the intact animal, the computer simulations quickly lose all connections with reality. The following examples of recently completed and ongoing research projects demonstrate the valuable contribution made by the use of animals in humane research projects and could not have been performed in animal alternatives such as tissue culture, anthromorphic dummies, or computer models.

The daily progress of clinical cardiology and the improvement in care that it provides depends upon animal research. Early attempts to revascularize a myocardium with a compromised blood supply were first developed in animals before they were used in humans. Coronary bypass surgery is one of the foremost methods used to control cardiac pain in patients who cannot be treated successfully with drugs.

Virtually all the methods that we use today to diagnose myocardial infarction from the serum changes that occur, as well as current imaging methods, were developed in animals.

Materials used to encapsulate pacemakers require trials in animals before they can be used in humans. In addition, more reliable lead systems to pacemakers must first be developed in animals.

In our Department of Medicine research has demonstrated the role of the pericardium in modulating the interaction between the two sides of the heart. These experiments involved studying dogs before and after removal of the pericardia, an experimental procedure that would have been unethical to perform in humans. As a result of this work, a more rational use of vasodialator therapy in certain cardiac conditions is being developed. In addition it appears that removing the pericardium may be a potential treatment for a reduced cardiac output following infarction of the right ventricle.

The hereditary cardiomyopathy of the Syrian hamster provides an ideal model for the evaluation of factors which may limit the development of human cardiomyopathies. For example, recent studies have suggested that calcium channel blockers, such as verapamil or beta blockers may limit and help prevent cardiomyopathy in animals. Very recent ongoing studies in humans suggest the possibility that these drugs may also be helpful in cardiomyopathies of patients. Therefore the Syrian hamster has become extremely important in evaluating potential drugs which may be helpful in this regard.

Over the past three years, our faculty has developed a technique for closed chest destruction of the His bundle in dogs. This technique is now being applied to patients with severe heart rhythm disturbances who are refractory to drug treatment. This procedure, if successful, precludes the need for open heart surgery. This advance would not have been possible without careful prior work in animals.

Even though they are not commonly thought of as laboratory animals, the pregnant ewe and newborn lamb have been used extensively in perinatal studies. Research on these animal models has led directly to major advances in modern perinatal care. For example, because of the work performed by Dr. Rudolph and others we can now close a patent ductus arteriosus in newborn children using the drug indomethacin as opposed to the pervious method - performing intrathoracic surgery.

This model has also resulted in the prevention of preterm labor with drugs such as ritodrine and has been responsible for fundamental understanding of perinatal fetal cardiovascular physiology which influences daily decisions in intensive care nurseries. The model has also aided in the development of monitoring methods now used for watching the fetus during labor and delivery and has provided fundamental understanding of fetal nutrition and metabolism which influences care in pregnant diabetics, malnutrition states, and mothers with vascular disease.

The pregnant sheep model has recently received national attention because of work performed here relative to the treatment of the human fetus with birth defects. Through sonography one can diagnose certain defects in the human fetus. However, until recently our knowledge of the physiology of various defects was so rudimentary that we did not know what to do to help them. For this reason we turned to the experimental laboratory animal to try to work out the problems before trying to help a human fetus. For example we have shown that it is feasible to correct a congenital diaphragmatic hernia in the fetus.

By using fetal lambs, fetal swine and fetal rabbits, we developed a model for congenital urinary obstruction and its relief. This animal model led directly to the first successful human fetal intervention in which we placed a small shunt in a human fetus. This would never have been attempted without our work on the fetal animal models. Currently we are investigating in animal models whether it will be possible to relieve congenital hydrocephalus in the fetus. Babies with this problem are frequently born severely retarded because their brain has been damaged by fluid buildup. It is our hope that intervention in the fetus will completely prevent brain damage from this condition.

The study of lung fluid balance in fetal and newborn rabbits has served as the basis for restricting salt and water administration to small, sick newborn infants. This has been associated with a decrease in the mortality of infants less than 1500 grams, from about 50% to about 10%.

Recent studies on ion transport and mucous secretion in dogs, cats, and ferrets have given important new insights into possible abnormalities in lethal and disabling diseases, including cystic fibrosis, asthma, and chronic bronchitis.

Use of animal models has also permitted the development of all principles for application of neurostimulation of the urinary bladder and sphincters in paralytics and others who have compromised urinary control. This program has reached the level of clinical trial in humans and offers, for this first time, a means of restoring bladder control for such patients. These techniques offer the potential for reducing the risk of early death due to secondary renal failure in these individuals.

In our Department of Radiology we have studied the adverse reactivity to radiographic contrast material, a problem which produces over 500 deaths per year in patients in this country alone. To study the pathophysiology of these reactions would be impossible in human patients, and without animals we could not fruitfully endeavor to understand the problem and diminish the number and severity of reactions. In addition, our development of tantalum as a contrast material for bronchography was developed in animal models.

Faculty here have utilized Gunn rats to learn how to manage severe jaundice of the newborn which can result in irreversible brain damage. Gunn rats inherit a lifelong jaundice very similar to the transient hyperbilirubinemia that occurs in many newborn infants. Observations and experiments in Gunn rats have led to the discovery that visual light enhances bilirubin elimination by the maturing liver. Based on this information it was possible to design an effective mode of preventive treatment - exposure to blue light - for all newborn infants with significant jaundice. This new form of therapy has saved thousands of newborn infants from irreversible brain damage caused by the hyperbilirubinemia and from having to be subjected to a more invasive form of therapy such as a complete exchange blood transfusion.

By using inbred strains of mice we have gained an increased understanding of the T and B cell types which has allowed a greater understanding of the normal and pathological changes which occur in lymphocyte populations. These techniques, after being carefully delineated in animals, are now being used in humans for the diagnosis of different types of lymphoid tumors. For example, in ocular oncology we find them invaluable in separating out those patients with benign lymphoid proliferation of the orbit from those patients with lymphomas in the orbit. It is important to note that when only histological methods were used, this was incorrectly diagnosed in up to 50% of cases by the best pathologists in the world.

The immune response to Hepatitis B surfact antigen and its synthetic analogues can only be tested in mice, guinea pigs, and rabbits. Without immunologic understanding of this antigen, and without safety and efficacy testing of proposed immunogens in chimpanzees, the vaccine for control of viral hepatitis type B would have been impossible and further improvements are inconceivable.

Our Division of Plastic and Reconstructive Surgery has demonstrated the advantages of using muscle tissue to cure surgical infections, in particular osteomyelitis. The basic data, which was developed in a laboratory with the use of dogs, is directly applicable to the care of patients with chronic infections, particularly of the bones or joints.

In the Department of Orthopedic Surgery, research is currently underway to determine whether the use of certain drugs will prevent rejection of certain bone and joint transplants. Information obtained from these experiments will be valuable in treating both humans and animals that may have major bone loss, arthritis or bone tumors.

Work on rats, cats and other animals in the laboratory has clearly shown that stimulation of very specific centers in the brain produces profound analgesia and elimination of pain. This work has opened up the rapidly expanding field regarding the nature and function of brain polypeptides. These studies have shown that stimulation of these areas of the brain of people who were suffering from chronic and totally intractable pain could be treated by this method. We now employ those techniques in ever increasing numbers as are other centers throughout the United States and Europe. Here is an example of where a great deal of human suffering has been eliminated from the clinical application of pure, basic science experiments in laboratory animals.

These are but a few examples of the 350 research projects currently underway in our school involving the use of laboratory animals. We implore the Subcommittee and the Congress to consider the value of such research when considering new legislation affecting the use of laboratory animals. I further request that this letter be made part of the record of the Subcommittee hearings on this subject.

Sincerely yours,

Julius Krevans

Julius Krevans, M.D.
Dean

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October 27, 1981

Representative Doug Walgren
Cannon House Office Building
Room 117
Washington, D.C. 20515

Dear Representative Walgren:

As Dean and Vice President for Health Affairs of the University of Rochester, I request that this letter be included as a written statement for the record of the subcommittee on Science, Technology and Research's Hearings on the use of animals in biomedical research.

I would like to address several of the specific areas which will be examined and debated.

1. It is agreed by all biomedical scientists that "excessive, unnecessary, uneconomic or inappropriate use of animals" is not only ethically and morally wrong but also is wasteful of our limited economic and personal resources. There are excellent, but not perfect, controls built into the present research system in this country which minimize the stated excesses and misuses in the vast majority of cases. The extremely critical peer review system serves as a principal component of this effective system. First of all, all research projects utilizing animals are carefully reviewed by departmental chairpersons for scientific merit, suitability of the animal model and validity of the experimental plan. Secondly, veterinary specialists in laboratory animal medicine perform additional review paying particular attention to the appropriateness of the animal model, to humane aspects of anesthesia, analgesia and euthanasia, among many others and to the cost effectiveness of the animal model proposed. These two critical reviews occur prior to submission to N.I.H. or other funding agencies. Once the proposed project is submitted, it is critically reviewed for all these factors and more by scientists of the discipline in question as well as by veterinary specialists who are also consultants to the granting agency. Thus the peer review system weeds out the vast majority of those projects which are proposed that are not scientifically sound and necessary to advance the knowledge of the discipline. With drastic decreases in federal funding for biomedical research, brought about because of the most difficult of fiscal pressures brought upon the federal government, only those programs which can be thoroughly justified on scientific, humane and economic grounds as well will actually be funded. Researchers, themselves, are most aware of

this fiscal problem and are most careful about the use of these limited funds to insure the success of their research, which means to them success or failure as researchers, scientists and academicians. I firmly believe that our peer review system works, and works well, and eliminates the vast preponderance of proposals which are scientifically unsound and ethically, or economically unwarranted.

2. What are ways to promote even more humane and appropriate use of animals, including alternatives to animal use where possible? First of all, we must agree that scientists, regardless of their research discipline are not knowingly inhumane. Well trained scientists, in fact, work most diligently to insure that their responsibilities to their animal subjects are met with particular emphasis on humane considerations. Research training, for those who need to work with animals, therefore, must be supported so that the level of knowledge of the models which can be used in a given research program can be increased. It is inconceivable to me that alternatives to the use of animals can replace much of the research currently conducted with them. However, it is also clear that there are a host of in vitro techniques which have, and can further reduce the necessity for using living animals in research. Clearly, these alternative systems have a very real place in the armamentarium of the scientist but cannot totally replace the animal model systems. The dissemination of knowledge about the advantages and disadvantages of these alternative systems among and between disciplines perhaps needs to be enhanced to accelerate the utilization of these alternatives if they are, in fact, scientifically and economically sound.

Other measures which need to be employed in achieving our goal of more humane and appropriate use of laboratory animals include the expansion of training opportunities for veterinarians in the specialty of laboratory animal medicine. These specialists, many of whom are board certified by the American College of Laboratory Animal Medicine, serve in vital positions at their respective institutions where they interact with research scientists, graduate students and technicians who utilize animals and insure that the laboratory animals, on a day-to-day basis, are afforded adequate veterinary care, are treated humanely and are used appropriately.

Furthermore, more institutions should be encouraged to participate in the voluntary critical evaluations of their animal care and use programs conducted by the American Association for the Accreditation of Laboratory Animal Care. This association has been most effective in improving the overall quality of animal care and use at all participating institutions.

Finally, although the study sections and councils of N.I.H. do have considerable positive impact on the appropriateness and humane use of laboratory animals, it is suggested that more input from veterinarians trained in laboratory animal medicine be solicited and utilized. These veterinarians should specifically be charged with the responsibility of critically evaluating the appropriateness of the animal model, the facilities and resources available to properly care for the experimental subjects, and whether or not humane considerations have been properly addressed.

3. What may be done to create cost effective incentives to develop more and improved alternatives to animal use? It is important that targeted funds be made available to scientists who are attempting to develop alternatives to animal use within the various categorical institutes of N.I.H. Furthermore, funds should also be allocated for scientists to take such techniques and apply them to their specific application regardless of discipline. Publication of these alternative techniques, which have been shown to be efficacious, based on comparisons with animal models in critically evaluated professional publications--either existing ones or new media--for dissemination of this sort of information is also to be encouraged.

If an alternative method is scientifically creditable and can be shown to effectively mimic the responses obtained in living animals, they have and will continue to be adopted. Much progress has already been achieved in replacing some animal model systems with _in vitro_ techniques. Proposals for support for the development or adaptation of _in vitro_ techniques must require critical peer evaluation within the discipline of interest so that the investigations can be validated by scientists currently utilizing animal model systems.

The legislation currently before Congress, known by various names including the "Research Modernization Act" and various "alternative bills" while well meaning, would not be effective in achieving the overall goal of American biomedical research, i.e. improving one's understanding and control of the conditions which afflict our citizens. One cannot legislate scientific progress. It is necessary to increase funding, however, so that alternative methods can be developed and applied; but to take from 30% to 50% of the budget of the extramural programs of N.I.H., for example, and target it for "alternative methods" is most unwise if not, in fact, foolish. The effect of many of the bills would be to produce a bureaucracy to administer these huge amounts of monies; at the same time doing irreparable harm to ongoing scientifically sound research being conducted in American institutions, which has in the past and will continue in the future to produce many of the answers to the various questions raised by scientists in the public good. The bills currently before Congress would be extremely costly, in that there is every reason to believe that such a tremendous influx of monies targeted for "alternatives" would result in great waste and poor cost effectiveness and on the other hand remove desperately needed and ever shrinking financial resources for investigations currently under way with laboratory animals.

4. There are very few areas in which animal based research can be completely eliminated and as such, laboratory animals are crucially needed to protect and enhance human health. When newer technologies are found and confirmed with comparisons with animal systems, they are currently being adopted. The intrinsic complexities of the human or animal body cannot be duplicated in the test tube and as such any study requiring the understanding of the entire physiological or biochemical milieu to be intact, are not possible except in living animals.

Sincerely,

Dean, School of Medicine and Dentistry
Vice President for Health Affairs

Statement of James H. Zumberge
President, University of Southern California

The health sciences community of the University of Southern California and our colleagues at sister institutions engaged in biomedical research are gravely concerned about the implications of H.R. 556. Of particular concern are the Provisions of Section 12, directing 30% to 50% of grants to alternative methods of research in lieu of using live animals; and the Provisions of Section 8(c), prohibiting the use of live animals when an alternative method has been published in the Federal Register under Section 8(b).

I respectfully suggest that the imposition of such restrictions on the scientific investigator counters the very essence of current trends to alleviate Federal regulatory requirements. More importantly, these provisions foster denial of the concept of free scientific investigation which is essential to effective biomedical research in a free society.

This represents a gross intrusion by the Federal government on scientific judgement and the investigative freedom essential to the biomedical researcher. It is he who must decide which methodology best fits the need of the research at hand. This should not become a dictum of government whose legitimate rôle in the process we believe should be no more than informational and advisory. For government to go beyond this will lead to a self-defeating process which can vitiate significant research and destroy scientific incentive where Federal funding is involved.

This said, I am pleased to say that USC has long practiced high ethical standards in the use of live animals in its biomedical research. Each protocol is scrutinized by a Vivaria Committee and approved by the Vivaria Director. USC has also established an Animal Ethics Review Board comprised of a bioethicist, religionist, social scientist, professor of clinical law, a surgeon, our chief veterinarian, and a public member who will be appointed shortly. This Board has access to all uses of animals in USC research and serves as our special oversight committee to insure the consistent application of the highest ethical standards in the use of live animals in our research.

While alternative methodologies should indeed be explored and published for the information of investigators, we respectfully suggest that H.R. 556 would posture the United States Government in an inappropriate role which, rather than achieve the intended objectives, would deter critical biomedical research necessitating the ethical use of live animals. This poses not a mere administrative encumbrance for the researcher. It intrudes deeply into the very essence of scientific research and contradicts the fundamental ethics of research in a free society.

Recent years have witnessed major improvements in assuring the humane treatment of live animals in biomedical research. Scientific investigators have become increasingly aware of animal rights and the essentiality of according live animals rights comparable to those accorded to human subjects in medical research. Additionally, institutions engaged in biomedical research are acutely conscious of the need to avoid unnecessary duplication and waste of animals in research. These important improvements are significant factors for consideration in relation to the objectives of H.R. 556.

I and the medical community at USC urge you to defeat this measure and to balance reason and human health priorities against the political pressures of a single purpose, vocal group who seek to totally abolish the use of animals for medical research.

I thank the members of the Subcommittee on Sciences, Research and Technology for their consideration of these viewpoints which we hope will help them in reaching a judicious decision in this critical issue.

Testimony

by

John H. Jardine, D.V.M.
Head, Division of Veterinary Medicine and Surgery
University of Texas System Cancer Center

Mr. Chairman:

Veterinarians at the University of Texas System Cancer Center are in support of the main aim of various laboratory animal bills now being considered in the U.S. House of Representatives, namely, that serious and dedicated effort is needed to reduce the total usage of laboratory animals while pursuing medical investigations for the benefit of humans.

However, we oppose in fiscal 1982 any subtraction from regular biomedical research appropriations or authorizations of money to pay for the search for alternatives. We think that this search for alternatives should be funded on its own.

Immediately, the National Institutes of Health has under-used capability to reduce overall animal usage. Since the President will propose dollar cuts in the NIH budget for fiscal 1983, we think it especially important to fully utilize existing knowledge before starting new research of this type. NIH could greatly proliferate animal conservation methods by notifying, suggesting, or educating biomedical institutions at large with proven methodology. The National Institutes of Health and the National Toxicology Program earlier this year held a large symposium exploring alternatives. Some methods immediately available are not in widespread use and direct appropriations could be made to NIH for staging further national or regional conferences on the subject.

Examples of how advanced institutions approach this subject could be used in the proposed NIH training meetings or symposia suggested above.

For instance, the University of Texas System Cancer Center has a Research Committee which provides peer review of all research programs and projects and the Division of Veterinary Medicine and Surgery reviews all research programs, projects, grants, and contracts involving the use of animals for compliance and adequacy in a way that protects the animals against undue use and unnecessary pain. Such items as adequate veterinary care and space are covered, along with attention to adequate personnel, and adequate support for the individual project in terms of animal welfare. Alternative modes would be considered in each NIH review, as suggested above.

The University of Texas System Cancer Center, Division of Veterinary Medicine and Surgery provides 365 day/year, 7 day/week coverage of animal facilities. This year-round coverage includes routine and emergency medical/surgical attention by a qualified graduate veterinarian. We think this is integral for the investigatory use of animals, and existing statutes promote this sort of treatment as an immediately implementable method of achieving some of the goals of legislation now under consideration.

Thus, something practical could be achieved in a matter of months. The longer-term, creative, investigational approaches to reducing animal usage, properly need long-term support and should have their own appropriation.

After extensive debate and weeks of hearings, the Congresssional Appropriations Committees have in the last few years mandated a stabilization of the number of RO-1 research grants under NIH. Some of the proposed legislation would defeat this mandate by siphoning off RO-1 funds and training grant funds.

While the University of Texas System Cancer Center does support the search for alternatives to animal use for both humanistic and budgetary reasons, we must say that drug evaluation in animals is required because investigational drugs' effects on the whole animal organism must be known. Under existing law and sound scientific principle, data must be gathered and evaluated on possible drug side effects, metabolic fates, and other biological systems in animals. This helps clinicians to avert or palliate drug side effects when the drugs are introduced into Phase I human clinical trials or into approved therapy.

Legislators considering the group of animal bills herein addressed should be aware that other hearings running simultaneously in the Congress move in the opposite direction. That is, both the House and the Senate have held hearings on the subject of whether humans are receiving experimental chemotherapy after too little animal testing. There are no easy answers to these questions, whether approached from the point of view of avoidance of animal pain and death, or the avoidance of human pain and death. But this Committee should be aware of the contrary pressures impinging on all veterinarians in medical research programs.

The ultimate goal of all medical research is obviously to benefit the human patient. This is true regardless of the area of research, be it body processes or diseases afflicting them (i.e. heart, bone, brain, kidney, eye, etc.), or the etiology and prevalence of cancer in the human population of this nation and the world. This ultimate goal of cancer control has in recent years become much more costly because of increasingly complex federal intervention into the conduct of research. In fact, not only have costs increased, but progress in research has been slowed.

I cite as one example the case of o'p'ddd, a drug proven at the National Cancer Institute to be highly effective against one rare form of cancer. An "orphan" drug for years, it came to the attention of Calbiochem, a West Coast firm which was offered the National Cancer Institute's scientific data proving its safety and effectiveness if Calbiochem would apply to FDA for an NDA, or license, to market the drug. FDA invoked the much-discussed Goldenthal letter, a regulatory requirement calling for extremely costly and extensive studies of the metabolic fate in animals of any drug submitted for an NDA. The National

Cancer Institute had been distributing the drug worldwide for years, and even though the safety and efficacy of the drug were proven beyond reasonable doubt, FDA rigidly required compliance with the Goldenthal letter and the marketing of the drug was delayed for three years. Many, many animals were utilized to comply with the FDA requirement.

This is just one case easily documented because the data were originated by one government agency and submitted to another government agency. There is no question that other drugs, much more widely applicable and much more widely demanded, have similarly suffered untold regulatory costs in time and money.

Before any new animal welfare legislation is adopted, there should be the closest scrutiny given to the time and money costs to be incurred.

I have carefully reviewed all of the testimony Chairman Walgren has so generously passed on to me from the hearings, and I appreciated the opportunity to do so. The Committee has earned by thanks for sparing this instituion the time and expense of gathering the information.

Some of the witnesses have continually sought to place all medical scientists in the category of being totally oblivious to the needs and welfare of their research animal subjects. My twenty years of experience as a veterinarian and researcher convinces me otherwise. There are many scientists at my own institution and of my own acquaintance at other institutions who, in fact, have played an active role in reducing laboratory animal utilization by expression of sound judgment under existing statutes. University of Texas System Cancer Center is in favor of legislation demonstrably effective in reducing animal usage.

As new technology evolves and reaches acceptance in the scientific communtiy, I feel certain that alternative methods will be eagerly applied. As for the factor of repetitive experiments, where they are merely repetitive, both the reputation and the accomplishment of the investigator are at stake. Such repetition already brings upon its perpetrator the scorn of his peers. Your hearings heighten the intensity of the criticism and serve a very useful purpose. Repetition is compulsory in many scientific advances in some cases, for the inevitable biases an individaul investigator brings to his research must be eliminated in the interest of valid and reliable results. The only way to achieve such results is to have pioneering research repeated--and it is usually done so with built-in elements of new explorations--by persons other than the original performers of the experiments. If the research findings are not replicable, it is not acceptable science and the scientific community and ultimate patient population need to benefit from this demonstration of ability to replicate.

One significant and irrefutable fact, which bedside physicians and surgeons readily acknowledge, is the variance of individual patient biological response to any given mode of therapy. These phenomena are encountered by veterinarians and animal research scientists as well, and are a valid basis for replicate animal research before Phase I clinical trials.

No legislation should be adopted which impairs the essential ability to replicate pioneering research for the purpose of validating it. Progress has been made in decreasing the use of animals in research. One example is the Ames mutagenicity test which can detect 80% to 90% of carcinogenicities. However, animal testing is ultimately necessary to confirm results of the Ames Test and to provide quantitative data on the level of carcinogens that appears to induce tumors.

At University of Texas System Cancer Center, the use of animals will be required in many areas of research directed toward rapidly bringing new technologies into approved, new methods of human patient care.

Examples of these research efforts follow:

1. Radiobiology evaluation of fast neutrons treatment, (fractionation of dose and frequency of high LET radiation).
2. The pharmacodynamics of cancer chemotherapeutic agents in vivo.
3. Techniques and efficacy of bone marrow transplantation.
4. Endocrine definition and efficacy in therapeutic management of spontaneous neoplasia.
5. Biological markers in spontaneous neoplasia.
6. Efficacy of biological response modifiers in therapy of spontaneous neoplasia.
7. Techniques and modalities in hyperthermia nd their efficacy in the therapy of spontaneous neoplasia.

STATEMENT
BY
WARDS INC.
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For the

SUBCOMMITTEE OF SCIENCE AND TECHNOLOGY

of the

HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY

USE OF ALTERNATIVES AND PROFESSIONAL CARE OF ANIMALS IN RESEARCH

WARDS has been interested in the care of animals in research since 1954. We are grateful for the opportunity to submit our statement. We have known for years that there is no practical protection for animals in research despite the Animal Welfare Act of 1956. Even human subjects are just beginning to find protection. This was made clear at a House hearing of the Subcommittee on Research Oversight when Congressman Gore and others tried to discover any orderly procedure for action at the National Institute of Health (NIH) when abuse, such as injecting humans with DNA, was evident.

WARDS understands the research community's efforts to protect the freedom of the scientific processes. As Dr. Donald Frederickson, Director of NIH, said at this hearing,

> "The general community is generally willing to concede that agencies dispensing the funds have the right to exact certain requirements in their expenditures and accounting. Where the substance of science is involved, however, a more strongly held bias against administrative intervention comes into play."

In his insistence on protecting the scientist from the "too quick or strong invasion" by even their own peer group, however, it became clear that one of the main purposes of NIH is to prevent interference with research by laws and inspectors ignorant of the purposes and procedures of research.

This protection is understandable but the spectacle of animals tucked away in unfit, poorly supervised, shameful factory-type housing across the country is where WARDS knows changes must come, and where the scientific community has failed completely to recognize the unnecessary stress and suffering that it inflicts. In the modern mass attack on disease and with the advent of new surgical processes, a new commitment is necessary to bring the care of laboratory animals up to a standard which will meet the animals' physical needs and reduce the variables which presently flaw scientific inquiry.

While protecting the integrity of science, WARDS believes that this integrity depends on the professional handling of the animals upon which science is based. To this end WARDS proposes a central NIH-based animal care center which would work directly with local research laboratories to provide information and practical help in standardized care of experimental animals.

The understanding of animal care should be taught to medical students when their first patient (the animal) is placed in their hands. Irresponsible indifference at this point can't make better doctors. In short, responsibility for animal care can't be printed and hung on the walls and forgotten. There should be sensible precautions from which scientists and students exercise professional freedom instead of unprofessional disorderly guesswork.

For the human patient, the running of the hospital, ordering of equipment, nursing care, administration of anesthesia, and even the X-ray and lab work is not done by doctors. Yet, today's doctors do not see these services as an intrusion on their practice, they regard them as essential. The scientist who is attempting to do all this with no advice from people in related professions is leaving the care of animals to reluctant, untrained students because there is some ancient superstition that specialized support is not necessary. In this we are not necessarily advocating a complete centralization on the local level but a professional look at the situation, taking advantage of every modern system possible.

The scientists should welcome a center which would deliver information to professional researchers. Resistance to this idea is as archaic as the battle against nursing care for soldiers at the front during the Crimean War. In the modern fight against disease we need all the professions possible on the front line. We suspect that in our own time we did not go to the moon without a respectful attitude toward members of the many professions on the team. We believe there are wise scientists on the inside and thousands of decent people on the outside who can believe that this is an idea whose time has come.

A second essential for efficient research is proposed in the Research Modernization Act (H.R. 556) which would provide for a Center for Alternatives. Anyone who is enjoying the alternative of the vacuum cleaner instead of the broom, or the electric chain saw instead of the axe, can understand the advantages of new alternative techniques in science. The Center for Alternatives would accelerate research and promote the use of alternatives by requiring those who receive grants for experiments to review the available alternatives. However, there is no attempt to force scientists to use alternatives that are inefficient. They merely consider the new methods before choosing the procedure they will use.

The Center would include representatives from the Government agencies concerned with research. This places the promotion of alternatives in the center of the scientific community where responsibility should rest. The bill also recognizes the fact that since Government makes grants for research, it should assume the responsibility of acquainting scientists with alternatives which would be most effective from a scientific and budgetary point of view.

Much of the scientific community has the perception that the Act would obstruct "scientific freedom" and not allow production of comprehensive research results. However, a growing body of scientific literature and thought demonstrates that not only are results comprehensive but that the results are actually more reliable. Many scientists have, in fact, restricted their own freedom through their unwillingness to explore, in depth, the possibilities of alternatives. With research modernization, a new orientation to scientific experimentation would be born. Innovation and change have never hindered science's quest for knowledge before and they won't now.

It is hard to see why NIH is dragging its feet on the valid ideal of H.R. 556. The goal of this bill is to modernize research not to stop it. The bill needs some amendments, which are recommended in the section on alternatives in this statement. The scientific community damages its own image by resisting the promotion of alternatives, since a sensible public, is already in favor of these changes.

This legislation will attract the moderate people among those who respect animals, and the scientists who are eager to have available new ways to solve problems and perfect their findings. Congress, which is always looking for practical improvement and economy, and above all, for a consensus, should support this measure in place of more radical legislation or continued neglect of the subject.

We hope that Congress will see the benefits of both a Central Animal Care program and a Center for Alternatives. This is not just "an animal cause" but would be welcomed by the best of the scientific community as a way of minimizing variables and improving the methodology of research. These proposals offer a common ground for those on both sides of the issue to make progress toward their different goals.

WE NEED A BYPASS OPERATION

For the sake of economy, valid research and a sincere active ethic, the federal research establishment needs a bypass operation. The local research centers should be able to get help from central information centers on animal care and alternatives. Now this help is mired down with the overloaded ineptness of USDA, the indifference and confusion in DHHS, NIH, and the lack of organization in their local centers. This lack of central help in the medical establishments leaves a shameful vacuum. After 27 years, we are convinced of this. Along the way we have found many dedicated intelligent people who deserve a rewarding way to help inside and outside of research.

SITUATION IN USDA

The USDA Animal Welfare Program was created to enforce the Animal Welfare Act. Unfortunately, the program has not been effective in carrying out its mission. In addition to inspecting research centers, it is responsible for animal breeders, dealers, and to a limited extent, pet shops. It is expected to regulate airlines and surface traffic. USDA's primary focus with regard to animals is the inspection of livestock to prevent disease. This is a far cry from the research environment where USDA inspectors are looked upon as unprofessional invaders. Scientists respond only to their own peer group influence. WARDS interviewed two veterinarians in charge at research centers to get their opinion of the USDA service. They said:

> "USDA needs a major overhaul and facelifting. Everyone thinks it's a joke. AALAS (The American Association for Laboratory Animal Science) never would have had to exist if USDA had done its job."

> "USDA has the credentials on paper, but very little experience around the research community. Their people come into facilities and say they haven't been trained, and do not know as much as 'you do.'"

> "USDA inspections are haphazard; they don't see anything. One man brought his wife, he was too old to carry things. They should hire young people just out of school and pay them well enough."

In addition to low-quality inspections, the USDA record of legal enforcement by prosecution has been poor. In its 1980 annual report, USDA states that out of over 1,200 apparent violations, the agency prosecuted 20 cases. A study of the outcome of each of these cases would reveal further the problems faced by the USDA's overloaded and varied programs.

Dr. Pierre Chaloux, USDA Deputy Administrator for Veterinary Services, met with Humane organizations just prior to his retirement and made the following points regarding USDA's performance on the Animal Welfare Program.

> Animal welfare programs are not a priority within the Agency:
>
> The Animal Welfare Program is expected to do a $20 million job with only $4 million. The 1981 budget has not been increased to encompass inflation and additional duties.
>
> The Program must compete with human welfare programs that have been a well-understood USDA function.
>
> Court cases against violators of the Animal Welfare Act currently take months and sometimes years to prosecute, and the penalties given have been light. Thus, violators do not see legal action as a deterrent to their activities.
>
> Regulated personnel ceilings at USDA make it necessary to place employees who are untrained and uninterested in animal welfare into this new program.

A further problem USDA faces is the enforcement of U.S. Federal regulation CFR, Section 228(a)(4), which requires research facilities to report the number of animals used in painful experiments each year. WARDS opposed this reporting because we realized it was of no practical value. In addition, it was a time-consuming, expensive paper-over of the real situation. To the questionnaires of 1980, 673 centers said they used pain-relieving drugs on 481,716 animals and 165 centers said they withheld drugs from 122,650 animals because of the nature of the research. This is supposed to comfort us. It does not because WARDS realizes this regulation merely encourages the centers to require their veterinarians to sign reports which they know to be inaccurate or false. They may keep their jobs but it compromises their ethics. This reporting of painful experiments is useless paperwork and an unnecessary burden for USDA.

SITUATION IN DEPARTMENT OF HEALTH AND HUMAN SERVICES AND NATIONAL INSTITUTE OF HEALTH

WARDS' goal of professional care of animals in research is not a priority of DHHS and NIH. They refuse to acknowledge that a problem exists. Secretary of DHHS, Patricia Harris, settled the subject in these words:

> "All our institutes must meet standards for humane care and housing specified by the Laboratory Animal Welfare Act.... Moreover, we require our programs and those we support to follow the NIH Guidelines for the care and use of laboratory animals. The NIH Guidelines are more stringent than the Laboratory Animal Welfare Act."

But, in spite of these soothing words, a 1978 survey by the Institute for Laboratory Animal Resources (ILAR) reported that only 14 of the 21 research organizations within NIH itself even claimed to be following the NIH Guidelines. Moreover, out of all the responding laboratories only 77 percent even claimed to be complying with the NIH Guidelines; about half of these 603 laboratories claimed accreditation by the American Association for Laboratory Animal Science (AALAS), although AALAS had approved only 378 laboratories. Out of all the laboratories surveyed, 23 percent admitted they were not complying with the NIH Animal Care Guidelines or refused to answer the question. (For more information on the ILAR, see Appendix 2.)

NIH does not have a workable mechanism for dealing with human subjects in research, much less animals. Its new (1980) Debarment/Suspension from Eligibility for Financial Assistance Regulations were formulated to handle "serious violations involving matters which have important or dangerous consequences." Yet to Congressman Gore's consternation, it was brought out at the hearing of the Subcommittee on Research Oversight, that even these elaborate regulations failed to prevent an abuse as serious as injecting humans with DNA.

Besides debarment regulations, NIH has an alert memo which comes from the office of the Associate Director for Extramural Research and Training (ADERT). It notifies the Director of NIH and the Secretary of DHHS and other appropriate people within NIH that an applicant for a grant or contract is under investigation for fraud or abuse. The investigations are made by the Division of Management Survey and Review (DMSR). DMSR can suspend or terminate grants, if the grantee has materially failed to comply with the conditions of the grant. Unfortunately "material failure to comply" is not clearly spelled out.

In spite of these regulations, NIH has never blackballed a fellow scientist. The way that NIH disciplines or fails to discipline its scientists is not in the area of WARDS' concern. We deplore the failure to protect humans in research but this is a large area we cannot encompass. We introduce these subjects to illustrate the plight of the animals where there is no respect or system for their protection. Problems with the present system of reporting research abuses include:

- There is no formal procedure by which a local institution can report problems with a scientist.
- Institutional Review Boards are not informed. Problems may get to the Dean or the Department Head but never reach the Board because it has not been given power in its institution.
- NIH will continue to fund a scientist "until found guilty."
- Each case is cared for on a different basis.

OFFICE FOR PROTECTION FOR RESEARCH RISKS

The Office for Protection for Research Risks (OPRR) is an effort by NIH to monitor the well-being of research subjects, both human and animal. It requires "assurances" that the center's local Animal Care Committee has reviewed care procedures once a year. OPRR is not empowered to use site visits to verify the information. Without this assurance OPRR is vulnerable to the problems inherent in asking institutions to report on themselves. It involves the natural bias in favor of the center. In addition, it lacks real professional coverage of the situation. (See Local Care of Animals in Research at the end of this section.)

At NIH there are peer group inspections of research sites to assess the scientific merit of a project. Although huge sums are spent on the complicated machinery and operating equipment of research, the inspections do not cover the animals upon which the research is to be based or the environment in which they are kept. WARDS believes that such inspections are a condition of good research although they should be carried out and administered centrally through NIH by experts in the various facets of animal management.

Scientists who serve on the NIH Review Groups (which are a part of the NIH system to award research grants) are comforted by OPRR. At a meeting of the Chairpersons of the Review Groups, one of them said:

> "In my experience the study sections find a considerable amount of their own time and energy saved with the knowledge and the assurance that some institutional process has gone on."*

That disagreements do arise between the Review Groups and the Oversight Committee is evident from an NIH spokesman's statement: "Sometimes we've frankly disagreed about technical and clinical considerations with the institutional review boards." Another one commented that not all institutions have well-established institutional review boards as do the big

*Proceedings of the 1979 Meetings of the Chairpersons of NIH Scientific Review Groups," p. 35.

universities and that NIH must assume responsibility for the oversight function.

WARDS supports the mechanism of peer review in the scientific community. In the hands of professionals inside and outside of NIH, peer review could play a useful role in attaining the goals of quality care of research animals and increased use of alternatives.

LOCAL CARE OF ANIMALS IN RESEARCH

Reform in the care of animals is also necessary at the local level in research centers across the country. A hopeless picture is created by scientists who have no professional background in animal care, the casual interest of the Institutional Committee, the occasional visits of AALAS (The American Association of Laboratory Animal Science), good as they are, and the disorganization of USDA. This is the way layers of paper investigations can oppress a single project and create inefficiency and frustration. The single agency that makes the grants is in the best position to provide a means to monitor the conditions in these local facilities. This is just good business. The local institutions should be responsible for the care they have been paid to provide. Dr. Frederickson made this clear in his testimony in Congress. Up until now NIH has believed that anything more than a "gentleman's agreement" with its grant-recipients would interfere with research. This is not working in business and it is certainly not providing protection for animals in research. What follows is a case study from the University of Iowa which illustrates the confusing regulatory picture.

CASE STUDY: HOW CHANGE FINALLY CAME TO THE UNIVERSITY OF IOWA

BY ANN GONNERMAN, WARDS, FIELD REPRESENTATIVE

At the University of Iowa, the Animal Care Committee performed its annual review and then filed its assurances of compliance with animal care guidelines to NIH's Office of Protection from Research Risks. The USDA Section Veterinary Medical Officer made routine inspections, circled the same deficiencies regularly, inspection after inspection, showing no change from year to year. NIH site visit teams came and went, as they do in every major research facility in the United States, several times a year, ignoring the animal quarters, approving new research which would utilize even more animals, approving grant after grant totaling up into the millions of taxpayer dollars. The animals, housed in unsanitary, hopelessly inadequate, quarters, neglected in every way, were used by the millions.

In July of 1978, the Iowa Federation of Humane Societies was allowed to take a tour of the animal quarters. Two members of that group decided not to look and leave, and they were able after nine months of persistent requests to obtain an inspection by the Animal Care Specialist from the United States Department of Agriculture's Animal and Plant Health Inspection Service, who was newly assigned to the North Central Region. His inspection documented many intolerable deficiencies and violations of the minimum standards of the Animal Welfare Act. The Des Moines Register and Tribune published the facts. The USDA specialist immediately met with the University administration to determine how and when they would come into compliance. The rumor spread that the University might lose its Federal funds. The veterinarian in charge at the University was fired; a new, acting veterinarian was appointed, and the University of Iowa began the slow, painful process of making up long years of neglect and bad research. NIH's Office for Protection from Research Risks (OPRR) was aware of the conditions because Iowa sent an "assurance" which listed the deficiencies, but OPRR took no action because they maintain that USDA is responsible for inspections. There had been no discussion at OPRR of the serious deficiencies, failure to meet guidelines and policies, or possible fraud in the submitted assurances.

It took a miraculous combination of circumstances to bring reform. The two members of the humane society decided not to look and leave after the tour. They found a new USDA specialist who was willing to listen to their account of the situation which he then verified by his visit. The newspapers had the courage to blast a local university for its neglect. The rumor of the loss of funds further convinced the university to take action. The persistent follow-up by the USDA specialist has continued the reform. WARDS believes this proves we cannot always depend on a conversion of lucky breaks to change the terrible neglect of animals in research.

ANIMAL CARE IN RESEARCH

Center for the Environment of Animals in Research (CEAR)

The need for a centralized Federal program for the care of animals is amplified by a few quotes from veterinarians at research facilities who are trying to cope with the Federal disorganization:

> "If one agency could handle standards instead of USDA, NIH and the Good Lab Practices Act, it would be easier for us. We don't know who to respond to; every time we must respond to a different agency. Sometimes they are contradictory. And, anytime there is more than one rule, this is used as a reason not to abide by any of them."
>
> "When a grant is made, the animal care is the part least scrutinized. They can get away with lots of things. If grants are going to help animals, there must be some way of guaranteeing that it is used for the animals."
>
> "People who are on both sides of the fence must be able to communicate. There is fear and suspicion on both sides. Who suffers and is frustrated? It is the people who are trying sincerely to change the situation."

The purpose of central animal care is to eliminate as much stress as possible in the use of animals for research. This is no longer a laughable, lost cause of sentimental people but a scientific need which has been amply proved and its impact measured. It has been established that the animal patient in research that suffers stress can cloud the findings of a research project.

Dr. Frederickson said at a recent hearing, "Well designed clinical trials normally provide for alternatives to subjecting (human patients) to unnecessary or burdensome diagnostic procedures in order to satisfy the requirements of protocol." This is exactly what we are asking for the animal in research--that, where possible, unnecessary, stressful handling be avoided.

Dr. Vernon Riley, Chairman, Department of Microbiology, Pacific Northwest Research Foundation, has measured the stress which animals experience under the present routine laboratory procedures. His experiments show how stress weakens and even destroys the immune system, exposing animals to cancer and viral infections. Dr. Riley asks, "How many small animal experiments of the past and present may be seriously flawed because of inattention to the effects of stress in laboratory animals?" He called for a reassessment of the current laboratory animal standards and techniques related to animal experimentation. Riley's stress experiments showed that mice partially protected from stress showed less than 10 percent of cancer tumor incidence at 13 months of age compared to 92 percent to 68 percent, respectively, in unprotected groups. Another authority raises this same concern in his article "Why Painful Experiments and Lack of Proper Animal Care are Scientifically Undesirable." He writes, "The stressed animal is not normal either biochemically or physiologically." These findings make the unstressed animals an absolute necessity.

In a Congressional hearing on the land grant college it was brought out that money was given for research but nothing was designated for animal quarters. One Congressman asked, "How is research being carried out where research facilities are so scarce or inefficient?" Quality animal care is measurable, and should be documented in terms of the number of animals, space allowed per animal, and personnel available.

A major function of a central animal care center would be to strengthen the position of veterinarians in charge of animal care in research facilities. Congress wisely put these men and women in these positions to provide expertise in the speciality of animal care.

WARDS interviewed a veterinarian in charge of a research facility. He stated:

> "I have good top support at my Center. The Dean wants a good facility. Many facility administrations don't provide that support. The Dean and the Vice President must be behind you. Vets are in trouble in some of these places. One of the Big 10 Universities was using material most would call a bio-hazard. They refused to listen to the vet and the administration would not support him."

WARDS believes that the authority and responsibility of these veterinarians in the area of animal care must be clarified. Research is suffering from failure to make proper use of these professionals.

It is premature to talk about the exact structure and duties of the Animal Care Center. It must have the input of ILAR and AALAS. It could operate in the single goal pattern of the Food and Drug Administration, using highly trained personnel to work directly with the local research centers. Primarily it would be responsible for the design and maintenance of a healthy environment for the animals in research. It would support research into stress-free animal care, and the selection of appropriate animal models for research. The Center would also provide a central source of information and can borrow ideas from the National Cancer Institute and other institutes as to methods of making findings useful.

Such a center, dealing directly with the local research facilities, would bypass the present expensive confusion of the many departments at NIH while making available information on the valuable work already being done at NIH and other places.

A CENTER FOR ALTERNATIVES

WARDS supports the modernization of research through the use of alternatives, and the creation of a Center for Alternatives at NIH, which is provided in H.R. 556. The Center would be modeled on the various independent health institutes under the NIH umbrella, and it would have as its single goal the promotion of alternatives in research.

Currently, there is some evidence that NIH is trying to find substitutes for animals in research, but the efforts are scattered and modest in scope. The Laboratory Animal Science Program provides grants to define animal models, and this would reduce the waste involved in using an inappropriate species. The Institute of Environmental Health Sciences focuses on the methodology of good research. It is trying to improve toxicity tests which are currently "expensive, time-consuming, insensitive, and require costly professional staff time."* This division is also exploring the problems involved in extrapolating the results of tests on animals to man. Scattered throughout NIH's 11 Institutes, seven or more divisions of supporting services, and 46 buildings, there is a great deal of information on alternatives which must be made accessible if it is to be used. A Center for Alternatives would provide an information service modeled on that of the National Cancer Institute, which would make on-line data on alternatives available to veterinary and medical schools.

*1981 NIH Almanac, p. 111.

The use of alternatives can be open to endless arguments, but must finally rest on the judgment and will of the scientist. Only through the intelligent interest and consent of the individual scientist will research modernization occur. The Center for Alternatives would organize the information on alternatives and educate scientists in their use. It should be free from any sense of coercion. This new Center would foster the idea of alternatives until the value of these new systems for research is understood. The Center would be staffed with specialists in alternatives who could demonstrate and promote their use. Qualified people would be encouraged by grants to continue the exploration of alternatives.

The Center should not require any new elaborate scientific buildings or other expenditures. The only space necessary would be for a small central office within NIH to collect and disseminate information.

WARDS proposes two amendments to H.R. 556. First, that the subject of duplication will be dropped from the bill. As proposed, the bill seeks to "eliminate or minimize duplication of research and testing on live animals." WARDS feels that this goal distracts from the subject of alternatives, and that the idea of duplication in research is already being dealt with by at least two agencies, the Smithsonian and the National Library of Medicine. For years, WARDS has tried to bring some action to the subject of duplication. It is an important need of research, especially now that the public is aroused and concerned, but we must not burden the Center with trying to be all things to all people.

With regard to funding, the bill proposes that no less than 30 percent and no more than 50 percent of an agency's research budget must be directed to the development of alternatives. However, WARDS prefers to treat funding in the same way we do for the Animal Care Center. We would submit a carefully planned budget each year. This would permit the Center to grow naturally. A large static fund might be too much the first year and not enough for some other year.

WARDS' primary commitment is to prevent animal suffering wherever possible and to stop the staggering, useless, waste of animals where alternatives can be substituted. Congress should make possible the organization of this important subject. It is a modern economy move.

(Further information on alternatives in Appendix 3.)

APPENDIX 1

Breakthrough for Prevention of Stress

EXACT MEASURE FOR STRESS FOUND

There is a practical scientific breakthrough that should stop some of the unnecessary stress in animals in research. Dr. Vernon Riley, Chairman, Department of Microbiology, Pacific Northwest Research Foundation, has discovered that protective housing and handling of mice can eliminate stress and preserve their immuniological apparatus so they are able to defend themselves against infectious agents and many disease processes. He has perfected a means of measuring the extent of stress with a clearly defined process. This takes the evaluation of degenerative suffering of animals out of the realm of speculation or elusive subjective description. Through his procedure the smallest degree of stress can be perceived almost instantly, creating a repeatable MODEL of exactness.

Stress factors are extremely important in designing an experiment. Dr. Riley says, "A troublesome aspect of earlier studies was the failure of the investigator to appreciate the extreme sensitivity and rapidity of the physiological alterations occurring in animals exposed to experimentally or environmentally induced stress. In mice, critical phases of the stress syndrome are initiated immediately after the slightest disturbance. The physiological consequence of this stress may continue for hours or days depending on the nature, severity and duration of the stimulus."

The problem in measuring stress has been to arrive at "authentic quiescent baseline conditions for experimental animals." This has complicated the interpretation of some of the earlier studies. "Consequently, results between laboratories tend to be inconsistent, undermining confidence in the reliability of research in this field." He points out that rapid developments of new facts of immunology, endrocenology and neurobiology can further close the gap toward exact findings.

Dr. Riley further pointed out that "Although it may be hazardous to extrapolate biological findings from mice to other species, it would be equally impudent to ignore the many physiological similarities and analogous biochemical relationships that evolutionary biologists have demonstrated in animals belonging to the same phyla. Thus, fundamental biological principles that are further delineated through the study of animal models may be expected to have application to man."

Dr. Riley has found that "the rapidity of physiological response to handling induced anxiety stress is indicated by measurable increase in plasma corticosterone within less than 5 minutes after the animals have been agitated by simple capturing proceedings. The difference between stress in a conventional holding area for mice and an enlarged protective system was easily measured."

It is necessary to eliminate vibrations and rumblings of centrifuses, vacuum cleaners and heavy equipment. There must be protection from all drafts and air turbulence. There is need for a planned lighting system. In addition, transistor radios and loud voices disturb these animals. Chirping sounds between mice in open cages can be a means of spreading distress signals. Enclosed shelves provide a substantial amount of soundproofing from many alarming signals. With regard to segregation, it was established that males and females should be separated in different areas to prevent odors from being transmitted.

The rapidity of the physiological response to handling-induced anxiety stress is indicated by measurable increase in the plasma corticosterone quickly after the animal has been agitated by capture. It starts when the animals are transferred from the protective shelves. This means there must be a rigorous time limit in the system of handling these animals for any research process.

Dr. Riley has found a simple straightforward way to detect stress. This is an important measurement in a research plan because differences here can affect the outcome. If there is a latent cancer virus in the body, a defect in the defense mechanism could permit the disease to spread. This could be brought on from severe acute stress, from mild chronic stress, or intermittent stress. If an experiment is to be validated there must be a uniform, accurate way to arrive at the answers or humans will suffer and millions of animals will be wasted.

APPENDIX 2

ILAR NATIONAL SURVEY OF LABORATORY ANIMAL FACILITIES AND RESOURCES

The Institute of Laboratory Animal Resources organized a survey of U.S. research laboratories in 1978. Although it is subject to problems of interpretation which site investigations would eliminate, it provides a useful overview of the problems and trends.

> ILAR found that there was a failure of laboratories to achieve peer evaluation through AALAS accreditation. Although 603 labs claimed accreditation, AALAS has only accredited 378. ILAR raised the question of why 370 of the labs which had planned to become AALAS accredited in 1968 had failed to do so by 1978.
>
> ILAR discovered "acknowledged noncompliance with the DHHS guidelines . . . especially among DHHS respondents," and found this "obviously a matter of concern to most granting agencies in evaluating requests for research funds." ILAR recommended that "the basis for this noncompliance needs further evaluation."
>
> ILAR found an 18 percent increase in veterinarians specializing in laboratory animal medicine in the 10 years since 1968. However, their information suggests "substantial involvement in activities other than service, especially for professional personnel."
>
> ILAR reports a decrease in the number of laboratory animals acquired during the last decade except for swine, rodents, horses and cattle, but it reports an increase in the average length of stay. This suggests an increase in long-term studies.
>
> ILAR found that although laboratory animal facility space had increased by 2.5 million square feet since 1968, the accounting does not distinguish between space in which the animals are used, versus space for their comfort and housing.
>
> ILAR reports that 250 research centers have stated the need for new construction to contain biohazards.

ILAR reports a real decrease in expenditures for animal food and care costs.

ILAR recommends centralization of animal care programs within the research organization as the most efficient and inexpensive method. The survey found a decrease in the existence of centralized facilities in the last decade, with 54 percent of the labs centralized in 1968, and only 48 percent in 1978.

ILAR recommends financial accountability for animal care programs. User fees, one method of apportioning direct costs to research projects, have not been used sufficiently or in a consistent manner too ensure good management of animal resources.

ILAR reports that "The majority of respondents who acquire animals from their own breeding sources do not maintain genetic records, and that these in-house animals are more expensive than those from commercial sources. ILAR recommends careful maintenance of genetic records and the use of commercial sources for animals.

While supporting the recommendations of ILAR, WARDS further proposes:

Professional Standing:

A veterinarian with a staff should be in charge of animal care at each institution. He should have the necessary authority and professional standing to accomplish this task.

Cost Accounting:

The cost accounting for "Animal Facilities Space Needs" includes expensive equipment for the use of animals, but brings little health or comfort to them. It is incorrect to describe this use of funds as animal facilities. When this distinction is made, it is very clear that very little is even being requested to improve the life of the animals.

Biohazards:

This dangerous work should be carried on by a few specialized research centers equipped and ready to take the detailed precautions necessary for this work.

Effects of Stress:

More attention should be paid to high quality care to lessen the effects of stress resulting from a substandard environment, as this might affect the outcome of the study.

APPENDIX 3

ADVANTAGES AND DISADVANTAGES OF TISSUE CULTURE

W.M. Dawson, Department of Pharmaceutical Technology, University of Shaythclyde, Glasgow, has outlined the following:

ADVANTAGES

1. Eliminates errors about species difference. Species difference can occur at the cellular level as well as in whole animals.
2. A range of cell types can be used and thus differences in effect may be noted.
3. Application of tested substance is direct, often eliciting rapid results.
4. Often, the effect can be measured quantitatively.
5. Smaller amounts of the drug to be tested are required.
6. Materials (e.g. radioactive materials) potentially harmful to humans and animals can be studied.
7. Cellular material may be kept frozen.
8. Cells can be used in different countries, leading to better comparison of findings.
9. Main advantage to the manufacturer is cost.
10. Replicate experiments can be performed in statistically significant numbers.

LIMITATIONS

1. Can detect drug effects only if the drug acts directly on or in a cell.
2. Inapplicable to substances metabolized *in vivo*.
3. Inapplicable to drugs acting on multi-stage physiological systems.
4. Teratogenic (reproductive) defects cannot be directly studied *in vitro*.
5. Behavorial effects cannot be directly assessed.

APPENDIX 4

SOURCES

National Institutes of Health, Proceedings of the 1979 Meetings of the Chairpersons of NIH Scientific Review Groups (Fall 1979).

U.S. Department of Health and Human Services, 1981 NIH Almanac (1981).

U.S. Department of Health and Human Services. National Survey of Laboratory Animal Facilities and Resources (1978).

U.S. Department of Agriculture. 1980 Animal Welfare Enforcement; Report of the Secretary of Agriculture to the President of the Senate and Speaker of the House of Repesentatives.

Subcommittee on Department Investigations, Oversight and Research Committee on Agriculture, House of Representatives, July 29, 1980.

Submitted September 20, 1981.

Washington Humane Society
WHS/SPCA
7319 Georgia Avenue, N.W. Washington, D.C 20012 202/333-4010

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October 12, 1981

Honorable Doug Walgren, Chairman
Sub-Committee on Science, Research
and Technology of the
Committee on Science and Technology
House Office Building
Washington, D.C. 20515

Dear Chairman Walgren:

The Washington Humane Society is an 111-year-old humane organization which was chartered by the U.S. Congress in 1870. We have approximately 29,000 supporters spread across the country, with the bulk of our membership in the Washington, D.C. area.

We support the aims of H.R. 556 for the use, whenever possible, of alternatives to live animals in research. Sophisticated technology exists today that can be utilized to replace or greatly reduce the number of animals used in research. These alternatives have the potential to produce results that are both more valid and more economical to obtain.

The unnecessary use of animals is but one part of the animal research issue. Of even greater concern are the activities conducted in laboratories under the name of research. The scientific literature is replete with research projects, often duplicative, that are of dubious value to mankind - projects wherein animals are subjected to unnatural confinement and torturous stress and physical pain.

We draw your attention to Chapter IV, Part 1, Subsection I of the recent report prepared by the National Institutes of Health on a Silver Spring, Maryland research laboratory, the Institute for Behavioral Research (IBR). The following is attributed therein to Dr. David Rioch, Chairman of IBR's Animal Care Committee: "Dr. Rioch stated his belief that applying human expectations of pain to animal surgery was inappropriate because pain is primarily a matter of societal conditioning to which animals are not subject." One need not have degrees other than a degree of common sense to know that animals feel pain. It is horrifying, therefore, to hear such an opinion expressed by a member of the research community, and to know the atrocities that could be committed by a scientist who did not believe that an animal could feel pain.

The recent exposure of conditions at the IBR laboratory demonstrates how little protection the current Animal Welfare Act, as enforced by the Department of Agriculture, affords laboratory animals. Laboratories with documented conditions of filth and other violations of the Animal Welfare Act have been found to have "no deficiencies" by a Department of Agriculture inspector. The Animal Welfare Act needs to be strengthened, and to be implemented immediately by proper enforcement procedures.

We are disturbed by a document that several people have brought to our attention. This document, from one of the groups of proponents of more animal research, indicates that it is their opinion, after spending time on the Hill, that some members of Congress have put their names on H.R. 556 simply because of "great pressure from home", but are quietly urging that the bill be shelved. We understand that, in the interests of having access to all relevant information, members of Congress must keep up good communications with people on all sides of an issue. However, if there are any members of Congress to whom the above opinion of the animal users group might apply, we hope that they will seriously consider that the people from home who vote are becoming more informed and do not want their tax money wasted on unnecessary animal atrocities hidden under the guise of research.

The public is becoming increasingly unwilling to subscribe uncritically to assertions of the scientific community about the necessity of animal research for human well-being. Fortunately, the sanctity that has traditionally cloaked biomedical research is disappearing.

We urge the Committee, in the interests of both human and animal well-being, to proceed with all possible speed toward legislation that will assure an intelligent, compassionate and ethical approach to the use of animals in research.

Please see and include as a part of our statement the attached information flyer issued earlier this year by our Society in support of H.R. 556.

Sincerely,

Jean V. Goldenberg

Jean V. Goldenberg
Executive Director
The Washington Humane Society

WASHINGTON UNIVERSITY
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NOV 2 1981

October 29, 1981

Representative Doug Walgren
Cannon House Office Building
Room 117
Washington, D.C. 20515

Dear Congressman Walgren:

I am writing in response to the request of the Subcommittee on Science, Technology, and Research for information on the importance of animal models in biomedical and behavioral research. I hope that you will include this response in the hearing record.

To begin with, it is essential to note that recent federal initiatives in this area have severely restricted the use of human subjects for biomedical and behavioral research. Certain classes of subjects, including prisoners, the mentally infirm and institutionalized persons, can no longer participate in research because it is believed that they cannot give their consent freely. In the regulations for research in children, certain classes of research are, in fact, interdicted unless the research has first been performed in animals. Therefore any legislation limiting the use of laboratory animals would result in the cessation of most pediatric research.

I have communicated with a number of prominent physicians and scientists at the Washington University School of Medicine to obtain their points of view on this important subject. Dr. Gustav Schonfeld, Professor of Medicine and Preventive Medicine and Director of the Lipid Research Center writes:

"Heart disease is by far the leading cause of death in the United States at the present time. Atherosclerosis of the coronary arteries is responsible for the overwhelming majority of heart disease in otherwise healthy people and even more so in people with diabetes and other diseases. Because blood vessels cannot be examined directly in man except during heart surgery and at post-mortem examinations, experimental animals have played a vital part in research into the causation, prevention, and treatment of atherosclerosis. The rat, rabbit, monkey, pig, dog, and other species have helped us to understand the importance of heredity, diet, and blood pressure, and the roles of blood platelets, lipoproteins (cholesterol), and blood vessel walls in the causation of atherosclerosis. Perhaps even more important are the demonstrations that various diet and drug treatments can avert the progression of atherosclerosis, and that lesions may regress and even disappear. These findings make us hopeful that atherosclerosis also may be successfully treatable in man. The recently introduced methods of cell culture and the sophisticated biochemical and immunologic analyses are yielding much new information at the cellular and molecular levels on causation and potential therapy. But all of this information must be tested in whole animals in order to assess its applicability outside of "test tubes" in live animals. Therapies with good potential and low toxicity are then tested in man. Limitation on use of animals would cripple progress in this important area of research."

Dr. William M. Landau, Professor and Head of the Department of Neurology states:

"There are so many diseases of the nervous system that are chronically disabling and fatal about which we do not understand enough that a list of our problems would require volumes. Animal research has made invaluable inroads in understanding, prevention, and treatment of infectious diseases of the nervous system like poliomyelitis, and chronically disabling afflictions like epilepsy which still affects almost one percent of the population of this country. Experimental approaches to models of human disease are absolutely essential to progress in the treatment and prevention of multiple sclerosis, amyotrophic lateral sclerosis (Lou Gehrig's disease) muscular dystrophy, multiple sclerosis, stroke, myasthenia gravis and many others. The last disease, a distrubance of the nerve transmission to muscle is one where a new animal model has led to tremendous improvement in our understanding of the disease in man and improvement of treatment. But prevention and long-term cure are still to be attained.

"Humane treatment of animals, ranging from mice to monkeys, is both scientifically and ethically essential. Continued progress in understanding, treatment, and prevention of disease of the nervous system absolutely necessitates animal experimentation. We cannot use human beings as guinea pigs. We can do ethical research with patients only after we have carried the scientific process as far as it possibly can go in animals."

A communication from Dr. Sidney Goldring, Professor and Head of the Department of Neurological Surgery, contained the following assessment of the need for laboratory animals in his field:

"The specialty of neurological surgery came into being at the turn of the century. It was launched after the demonstration that the brains of animals are concerned with movement and sensation. Prior to that time, the brain was considered to be concerned only with ideas and thoughts and the notion that such things as paralysis or convulsions could be signs of brain tumors, infection or stroke was not a consideration. Without the demonstration, in animals, that the brain is vitally concerned with such neurologic function as movement and sensation, the specialty of neurological surgery, as we know it, would not exist. Today, neurological surgery provides treatment and hope for patients with brain and spinal cord tumors, stroke, head and spinal cord injuries, and epilepsy. These are very important facts when one considers that thirty-five thousand Americans are diagnosed each year with brain tumor. Stroke affects 500,000 people each year and costs four billion dollars annually in direct costs and lost earnings. Over

420,000 new cases of head injury and 10,000 spinal cord injuries occur each year. The over-all cost amounts to over 2.5 billion dollars a year. Over 2 million Americans are affected with epilepsy. The estimated annual cost is 3 billion dollars a year. Fortunately, there is currently a ferment of research in all of these areas. Breakthroughs that have occurred and are taking place derive predominantly from laboratory animal research. The importance of sustaining this momentum is obvious."

As you are aware, the federal government considered kidney transplantation such a significant advance for our citizens that it authorized an entire program, funded under Title XVIII of the Social Security Act (Medicare) to ensure that all citizens needing kidney transplants could receive them. Dr. Charles B. Anderson, Professor of Surgery and Chief of the Transplant Service at the Barnes Hospital has provided the following information:

"Preservation of kidneys prior to human transplantation is an important aspect of successful transplantation programs. The principles of human kidney storage are based entirely on the results obtained from dog experiments. It is now possible to preserve human kidneys for three days prior to transplantation. This would not have been possible without prior dog experimentation.

"Present investigative thrusts by the Transplantation Service have involved the deleterious effect a damaged kidney can have on a well-removed kidney if both are stored together. We now routinely separate "good" and "bad" kidneys and thus have a greater yield of viable organs.

"The regulation of blood flow to the kidneys is also being investigated relative to the influence of prostaglandins and thromboxanes. Regulation of renal blood flow may have an important direct and indirect effect on kidney function and hypertension. Investigative efforts center about the modification and release of these compounds in dog kidneys being perfused. There are approximately 4,000 to 5,000 kidney transplant operations performed each year and approximately 80% of these are cadaver kidney transplants, depending on the preservation of kidneys. The number of people in the United States who suffer from hypertension and who would benefit from research in this area is in the tens of millions."

Dr. Samuel B. Guze, Professor and Head of the Department of Psychiatry is an internationally recognized authority in his field. His department has been at the forefront of research on the biochemical nature of psychiatric illness. Dr. Guze comments on the importance of animals in psychiatric research as follows:

"Animal research is being conducted in the Department of Psychiatry in the area of developmental neuropathology to discover occult mechanisms of brain damage during development which might contribute later in life to neurological or mental dysfunction. We have shown from these animal studies that the once common food additive, monosodium glutamate, destroys nerve cells in the infant animal's brain. As a result of these animal observations, baby food manufacturers have discontinued the use of monosodium glutamate, thus probably preventing neurological or mental problems in later life for our children. We have also observed in animal experiments that a new sweetening agent that has been proposed as a substitute for cyclamates or saccharin can also have detrimental effects on the developing brain if the exposure occurs in early life. This information is currently being taken into consideration by the Food and Drug Administration in the decision it must make regarding the advisability of the widespread marketing of this sweetener. It is both unethical and unthinkable to peform such studies on human fetuses or infants and immoral to permit the ingestion of potentially toxic substances because animals cannot be used in research.

"Clinical studies from many laboratories indicate at least 5 percent of men and 9 percent of women can expect to have the mental illness called primary affective disorder at some time during their lives. About 10 percent of affectively disordered patients are "bipolar" i.e. the patient has mania. Lithium is a drug used in the effective control of mania. We have found using animal experiments that lithium produces a biochemical change in rat brain. By studying this change in animals we expect to obtain valuable information with respect to the origin, prevention, and treatment of this illness. It is not possible to effectively study bipolar affective disorder, its cause, and treatment without the use of animals because the biochemical parameters involved cannot be studied in human subjects (sacrifice of the test animal is necessary). It is unreasonable and unfair to those suffering from or who will suffer from affective disorders to refuse them the help they might receive because animals (rats in this instance) were not available for study.

"In our laboratories anatomical studies with animals have shown that blood vessels and blood flow in the brain are controlled by biochemically defined nerve systems. From these anatomical and biochemical studies in animals we are now able to study the mechanisms in the actions of drugs used in the treatment of mental illness, as well as to study possible mechanisms of the progressive damage occurring in strokes and head injury. We are also using animals to develop a clinical test for the presence and extent of brain damage following stroke or head injury. It is unthinkable and unethical to attempt to study these conditions in human patients without first evaluating and testing in animals the methods and dosages that can be safely and effectively used.

"We also study biochemically acute and chronic effects of alcohol and narcotics on test animals. Human studies have shown 68% of adults in America drink alcohol on occasion and 12% are classed as heavy drinkers (i.e. drink nearly every day and become intoxicated several times a month). Studies of adopted children of alcoholics who were separated from their parents in infancy and raised by non-relatives show that these children of alcoholics had significantly more alcohol problems than did children of non-alcoholics. It is, therefore, important to understand the underlying genetic and biochemical causes of alcoholism. The biochemical effects of alcohol cannot be adequately studied without the use of animals since it is obviously both unethical and amoral to attempt to induce or create alcoholism in human subjects. It is also impossible to study the progressive biochemical effects of alcohol on the central nervous system in humans since sacrifice of the test subject is required. Studies of drug addiction are similarly impossible without the use of animals."

You may be familiar with the outstanding work of Dr. Paul Lacy and his colleagues in the area of diabetes. Dr. Lacy who is Professor and Head of the Department of Pathology is a pioneer in the field of islet cell transplantation. Insulin is made and released by the pancreatic islet cells and is deficient or absent in the diabetic. It is estimated that there are over 5 million diabetics in this country. It is a leading cause of death and blindness among our citizens.

Dr. Lacy writes:

"The following is a single example of the disastrous effect that would occur if the exemption for the use of animals in research by scientists in hospitals or laboratories is deleted. The example is taken from my own current studies and represents one of a myriad of examples that could be cited. We are now able to transplant islets (insulin producing cells) from one strain of rats to another strain of rats with diabetes without having to give drugs to maintain the transplants. The islets are not rejected and the diabetic animals are reverted to normal and have remained normal for more than one year. This startling finding opens the way for the possible use of islet transplants in diabetic patients. It also raises the possibility that the approach we have developed could be used for heart transplants and kidney transplants. A series of studies in animals have to be completed before we can use this method for islet transplantation in Man. Obviously, if these experiments in animals are prohibited, then someone would have to tell the 4% of our population with diabetes that there is no hope for your disease - you will continue to develop blindness, kidney failure and heart disease, and nothing can be done to help you."

Significant advances in the eradication and control of infectious diseases have been made in this century. All of these advances have depended on the use of laboratory animals. Dr. Gerald Medoff, Professor of Medicine and Chief of the Division of Infectious Diseases cites the following examples:

"The two outstanding achievements of medicine over the past century are the development of antibiotics and vaccines. Of course neither would have been possible without animal experiments. We continue to try to develop new vaccines and antibiotics and we continue to require animals for these purposes.

"One of the best modern examples of the dramatic effects of a vaccine on the prevalence of a serious disease is the polio vaccine. Although crippling disease recognizable as paralytic poliomyelitis appears in records of early antiquity, it began to be described as a clinical entity only in the late 18th and early 19th centuries, and became the subject of intensified study after increasingly severe epidemics began to appear in Europe and North America. In the five years prior to the use of polio vaccine in 1955, an average of 38,000 cases of poliomyeltits (approximately 16,000 paralytic) were reported annually in the United States. In contrast, with widespread immunizations during 1973-1975, only 20 cases of paralytic polio occurred over the entire three year period.

"Experimental work leading to the development of the vaccine only became possible with the successful transmission of the disease to monkeys in 1908. During the next forty years, it was shown that the virus was present in the stools of patients, that subhuman primates could be infected by the oral route, and that strains could be adapted to growth in laboratory rodents, permitting an expansion of laboratory studies. When it was discovered that poliovirus can be isolated and cultivated in culture in cells derived from monkey tissue, this led directly to the development of the vaccine.

"Presently, there are several diseases equivalent to polio in terms of prevalence and morbidity and mortality that require the development of vaccines. Hemophilus influenzae and Group B Streptococcal infections are the most serious because they cause meningitis in young children. Both require the same kinds of animal experiments if we are to duplicate the great success of the polio vaccine.

"The second point is the continuing efforts to keep ahead of the ability of bacteria to develop resistance to the presently available antibiotics. This requires the discovery of new antibiotics and modifications of the old to achieve better treatment. The way antibiotics are tested has not changed since the discovery of sulfa and requires extensive animal experimentation. First, the antibiotics are tested against the bacterial pathogens in culture. If the antibiotics are effective, they are then tested against infection by these bacteria in animals. If they appear effective, the best routes of administration, dosage and important side effects are learned about in animals. Only after the drugs are found to be effective and relatively non-toxic are they tested in humans. The absence of animal experimentation would essentially eliminate any possibility of further antibiotic development."

Dr. Bernard Becker, Professor and Head of the Department of Ophthalmology, is one of the leading ophthalmologists in the world. He and his colleagues have been at the forefront in the development of treatment for glaucoma, cataracts, and other diseases of the eye. Dr. Becker states:

"Animal experimentation is extremely important in the field of ophthalmology. Animal models of eye diseases closely simulate the human conditions. Animals are studied in a humane way using topical or systemic anesthesia. The results of studies on rabbits, monkeys, and rats have provided basic scientific information on the normal function of the cornea, retina and lens as well as the mechanism by which the eye maintains its normal pressure. Knowledge from these studies have provided a better understanding of these functions as well as the disorders that occur clinically. Many examples of treatment of human conditions such as corneal transplantation, glaucoma therapy, diabetic eye complications, cataracts, infections, etc. are derived directly from animal studies. We must continue and expand animal studies in order to understand, prevent, and treat blinding eye diseases."

Dr. Stuart Kornfeld, Professor of Medicine and Biological Chemistry and a Director of the Division of Hematology-Oncology writes about the importance of laboratory animals in research on cancer and other blood diseases:

> "In the field of hematology and oncology, animal experimentation has had a major role in the development of successful treatments for several diseases in humans which previously had had a fatal outcome. To cite just a few examples. The successful use of bone marrow transplantation in patients with aplastic anemia and leukemia grew out of studies of this procedure in animals. Without the animal work it would have been impossible to understand the factors which are required for a successful bone marrow transplant in humans. Similarly, many children as well as adults with a variety of cancers are now treated successfully with chemotherapeutic drugs which were evaluated for their anti-cancer activities in animal models. These drugs could not have been developed for human use without the availability of animals models for testing the drugs for anti-cancer activity as well as harmful side effects. At the present time there are hundreds of researchers using animal models to develop new forms of treatments for cancer. There is little doubt that cancer research would receive a severe blow if animal experimentation is curtailed. Since cancer is a leading cause of death and disability in our country, it would be tragic to limit this research."

Recently, I have noted significant publicity about a relatively little known disease called lupus erythematosus. This is a disease which affects young women for the most part and until recently, the life expectancy of a patient with lupus was less than three years. Dr. Bevra Hahn, Associate Professor of Medicine and Director of the Arthritis Center, writes about the role of animal models in the treatment of patients with lupus erythematosus:

> "Our research laboratory maintains a colony of approximately 200 mice of very special strains that cannot be purchased commercially but must be supplied by scientific investigators and bred by the investigators receiving them. These mice are special because they all develop systemic lupus erythematosus (SLE) which in some strains is nearly identical to the human disease by the same name. For ten years I have been experimenting with these animals and I have developed several treatment regimens which prevent or improve their disease and which have been directly applied to human species with great success. We continue to use these animals with the purpose of providing insights into the cause of SLE and to continually try new therapeutic approaches so that our therapy of the human disease can improve. Partly as a result of experiments in these mice, 10 year survivals in patients with SLE has improved from zero in 1955 to 70 percent in 1979. We hope to improve those figures to 100 percent. The animal models of the disease, namely these experimental mice, are absolutely essential if we are to make any progress in therapy. Obviously, new experimental methods cannot be applied directly to humans before testing in animals.

"I would like to state also that we are very careful to treat our animals humanely. Many of them must be sacrificed in order to determine the extent of disease; this is done in a totally painless way. When they receive drugs they are often injected but this is only temporarily uncomfortable.

"We are proud of our mouse colony, take good care of it, and feel that the studies in these animals have been most helpful for pioneering treatments for a previously lethal human disease."

Dr. Louis V. Avioli, Professor of Medicine and Director of the Division of Bone and Mineral Metabolism is a leading authority on bone disease. Dr. Avioli has sent me the following statement:

"Animal experimentation has been an essential part of our research program. The bone mass loss we have observed in young juvenile onset diabetes has convinced us that an acquired defect in skeletal turnover occurs in children with this disease. In order to evaluate the effect of insulinopenia on skeletal metabolism in depth, we must turn to the animal model with streptozotocin diabetes mellitus.

"We are also caring for a number of children with the hypophosphatemic form of vitamin D resistent rickets (VDRR) and evaluating the response to therapy. We also perform detailed experiments in the genetic VDRR mouse model in order to determine the inherited defect in vitamin D metabolism and renal phosphate wasting. Obviously, the underlying defect in this crippling disorder of children could never be uncovered by performing the initial research in humans."

In addition to the examples cited by Dr. Avioli, he and his colleagues are performing important research on the causes of osteoporosis, a painful degenerative bone disease affecting many of our older citizens.

I hope that you will evaluate this information carefully as you and your colleagues in the Congress consider the bills that have been introduced which would either begin to restrict the use of animals in biomedical research or would divert large sums of money from research agencies such as the NIH into a targeted alternative research program. I recognize that there has been a great deal of concern over the conditions in the Laboratory at Silver Spring. However, one should not adopt sweeping legislative changes that will seriously affect the lives of millions of human beings because of one, two, or even ten examples of abuse. Rather, we should rely on and properly enforce the substantial federal regulations promulgated by the Department of Agriculture with which most research institutions are in full compliance. At Washington University our animals are under the supervision of trained veterinarians and are provided with ample food, shelter, constant temperature and clean cages of proper dimensions.

The future hope of many of our citizens afflicted with serious and disabling disease depends upon the wisdom of you and your colleagues in the Congress.

Sincerely,

M.K. King

M. Kenton King, M.D.
Dean

APPENDIX II

ANALYSIS OF CORRESPONDENCE

There was an overwhelming response to Congressman Walgren's announcement of hearings on the use of animals in research and testing and his call for public comment on the various pieces of legislation pending before the Subcommittee.

Literally hundreds of letters, petitions from various groups, postcards and personal statements were received from those wishing to go on record as being in support of H.R. 556 (to promote non-animal methods) and H.R. 4406 (to amend the Animal Welfare Act to assure humane treatment of laboratory animals.). Almost 95% of the correspondence received was in support in H.R. 556 and a much smaller percentage of these letters also supported H.R. 4406. This may have been due to the fact that H.R. 556 was introduced early in the Congressional session and H.R. 4406 was introduced August 4, 1981. However, many of the letters that were received dealt exclusively with H.R. 556 and, in fact, specifically requested that no consideration be given to other legislation (namely, H.R. 4406) that would detract from H.R. 556. Correspondents focused on the need to substitute in vitro and other methods for animals in research, the current lack of public input on animal care committees, redundancy of many scientists' work and the problems that arise in extrapolating research done on animals to meet human medical needs. Many individuals stressed ". . . compassionate treatment of all animals who share the earth with us and who bring us loyalty and happiness. . .", and many others asked the question of 'would the money wasted on duplication (of experiments) be better put to use on research on alternatives?. . ." Many groups filed statements for the record which appear in Appendix I.

Scientists representing many varied disciplines also communicated with the Subcommittee regarding specific pieces of legislation as well as the subjects of "adjuncts" to animal research and the humane care and treatment of research animals. Their comments centered on several points:

1) It is a fallacious assumption that research animals are knowingly treated unkindly or cruelly by research scientists. In fact, ". . . humane treatment of animal (subjects) is scientifically and ethically essential . . ." Many cited the statistics compiled by ILAR showing that utilization of animals for scientific research has fallen by 40% in the last decade ". . .attesting to the awareness of the scientific community that superfluous animal experimentation is unconscionable. . .";

2) The whole animal as a model system will never be replaced completely by _in vitro_ or mathematical models although ". . .much progress has already been achieved in replacing some animal model systems with _in vitro_ techniques. . ." Moreover, ". . .when newer technologies are found and confirmed in comparisons with animal systems, they are currently being adopted. . .";

3) The extensive review by both granting agencies and editorial boards of scientific journals insure that experimentation not meeting the criteria of both scientific merit and potential for answering basic questions in a most efficient manner is not recommended for funding approval, and experiments which do not indicate a concern for the animals involved (meeting specific criteria in several journals) are not accepted for publication.

Letters from the academic scientific community and from scientists at private research facilities and in the major pharmaceutical houses were both thoughtful and thought-provoking. They were unanimous in their condemnation for careless or inhumane treatement of animal subjects and several were supportive of the spirit of H.R. 4406 (although objections were made to specific provisions of this bill). In addition, almost all of the scientific correspondents were supportive of additional funds to upgrade animal care facilities to meet the highest standards. However, these funds were not to be derived from the pirating of existing biomedical research dollars. Neither should money be taken from current support of biomedical research to specifically fund non-animal using methods. In all, several hundred letters were received from the scientific constituency.

Selected letters from scientists and non-scientists follow.

THE NEW YORK ACADEMY OF SCIENCES

September 28, 1981

Hon. Douglas Walgren
Chairman of Subcommittee on Science, Research and Technology
Rayburn Building, Room 2319
Washington, D.C. 20515

Dear Congressman Walgren:

The New York Academy of Sciences Ad Hoc Animal Research Committee shares with the Subcommittee many of their concerns regarding the status of animal research in this country. It is essential that biomedical research with animals be conducted under the most ethical and humane conditions. It is also essential that the potential for funding biomedical research not be curtailed. To do so would be to endanger human life and health. Our country, which leads the world in public health and safety, will fall seriously behind. We therefore would like to draw your attention to a number of issues directly relevant to the Bills currently under consideration.

Bills H.R. 556, 930, 220

We recognize the merit of alternatives to the use of animals in research in order to reduce the number of animals used. However, it must be appreciated that this development can only parallel scientific research with animals, not replace it, nor even reduce it substantially. Years may pass before satisfactory alternatives are found. In the meantime, science and medicine must continue, using alternative methods as they develop. In this regard, the Subcommittee doubtless knows of the many grants the NIH have already funded to seek alternatives. Government agencies in general are well aware of the need to develop alternatives to animal research, although little attention has been given to these efforts in the emotional turmoil accompanying these present proposals. The fact that there is government interest does not, however, guarantee immediate results. It may be of interest to reflect on the advice of the late Professor David Smyth who, until his death, was the Honorable Chairman of the Research Defense Society in Britain. In his review of alternative methods he stated "The setting up of a special institute to develop alternatives is unlikely to achieve anything useful. Evaluation of the results of such work would require comparison of the new alternatives with existing methods using animals, and such an institute would require a very large animal house and the carrying out of a larger number of animal experiments not directly aimed at solving any medical or scientific problem." (D. Smyth, Alternatives to Animal Experimentation, Scolar Press, London, p.167.)

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The provisions of the Bills disturb us greatly. One states that duplication of experimentation would be eliminated or minimized (H.R. 556). Eliminating duplication would mean abandoning a basic tenet of the scientific method. The results of an experiment can only be considered valid if they can be duplicated by other scientists. Without such procedures the possibility of experimental error cannot easily be eliminated. In actual fact, duplication is probably the method of "checking" results which is most conservative of animal life.

We are perplexed by the condition that alternative methods, published in the Federal Register, are to be used, when appropriate, in place of animals. We feel that the same stringent review policy presently employed to evaluate living animal methodology should be applied to new alternative methods and that prior to their publication in the Federal Register they should be published in a refereed journal.

Bill H.R. 4406

The proposed amendments to the Animal Welfare Act, while well intended, are imprecise and inappropriate in several provisions. The first of these concerns the definition of "pain". One of the greatest obstacles facing individuals interested in the welfare of animals is in defining what constitutes pain and suffering in the various species. Although it is generally agreed that all vertebrates and perhaps many invertebrates can perceive pain through neuronal mechanisms similar to those operating in humans, it is also known that the thresholds for pain and the behavioral indices of pain are quite different in different species. Therefore, the application to animals, of principles used to prevent pain and suffering in humans, may be in error both as to the intensity of a stimulus required to cause pain and as to whether or not an animal is indeed suffering or in distress. The proposed amendments in H.R. 4406 define "pain" by using such terms as "hurtful" and "suffering" but neither of these terms carry any more meaning than the word "pain" itself. Prior to legislating the authority to prevent pain to any individual or group, whether it be the Secretary of Agriculture or an Animal Care Committee, it is essential that criteria be developed by which to evaluate pain and distress in animals.

A second major concern with H.R. 4406 is the proposal to delete the last sentence of section 13 (a) from the current act. Elimination of this provision would allow the Secretary of Agriculture to become involved with the design and management of research activities. We feel that this is an unacceptable intrusion on the rights of those engaged in research by individuals who are less well informed about the justification for animal use and the intent of the study. The best control over the unnecessary use of animals in research is through responsible peer review.

Our third concern is with Section 13 (a)4 which "precludes unrelated operative procedures or repeated procedures of the same type not united by a common hypothesis". This provision is unacceptable since the interpretation of the scientific hypothesis being tested and the methodology used will be made by individuals unlikely to be adequately versed in the details and implications of the study.

Above all, the Subcommittee should be aware that scientists are themselves concerned with the issues addressed in these Bills. One manifestation of these concerns is the Ad Hoc Animal Research Committee of the New York Academy of Sciences which has been involved with these issues for some time. We are proceeding with a program to develop ethical standards and humane guidelines for the use of animals in research and teaching. An educational program is also being established to teach appropriate standards and guidelines to all who will be involved in animal experimentation -- at any level. This program reflects scientists' concerns about the number of animals used, unnecessary duplication of experiments, and the need to minimize pain and distress to the experimental animal.

Enclosed is a recent publication which gives background information that is germane to the subject.

Respectfully submitted,

Jeri A Sechzer

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JAS:ea
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HISTORICAL ISSUES CONCERNING ANIMAL EXPERIMENTATION IN THE UNITED STATES

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Abstract—The use of animals for research and teaching has now become an issue of great concern in the United States. In contrast to the legislative systems in Britain, Scandinavia and many European countries, American scientists can pursue research projects with relative freedom. Recent activities in the United States may effect this practice and future animal experimentation may be subjected to restriction and control by legislation. Events leading to this possibility are similar in many ways to those in 19th century Britain prior to the passage of the Cruelty to Animals Act in 1876 (which licenses scientists, regulates experimentation and carries out inspections). Historically, it seemed that the immediate effect of the 1876 act was to decrease the number of scientists who could conduct experiments on live vertebrate animals in Great Britain and hence the number of experiments and animals. Yet, antivivisection activity in Britain did not decrease but continued toward its goal of abolishing all research with animals. By 1882, the medical scientific community established the Association for the Advancement of Medicine by Research which began to advise the Home Secretary on licensing scientists. This was a turning point for British science since large numbers of qualified investigators were licensed, the number of animal experiments increased, and experimental medicine and science in the United Kingdom soon became dominant. Thus, although the antivivisection movement in Britain did not ultimately halt animal research, it did raise the consciousness of scientists, the government, and the general public about the need for humane treatment of research animals and the limits to which those animals should be used.

Although the first Humane Society in the United States was established in 1866, it was not until the end of the 19th century when scientific disciplines were necessary for the education of physicians that protests against the use of animals for experimentation became organized. Activities by American animal protection groups have increased since that time and have now culminated in proposed legislation which if passed would not only restrict the use of animals for research but would also interfere with the kinds of research that could be conducted.

Legislation in Britain, Scandinavia and in many European countries appears to be efficient and effective because of the relatively small number of research institutions and scientists in those countries. Is legislation in the United States feasible considering the extremely large number of scientists and research institutions? American scientists are facing three possibilities: mandatory regulation (legislation), self-regulation, or some combination of both. Self-regulation of animal experimentation appears to be the optimal choice. It would reflect the success of animal protection groups in raising the consciousness and concerns of scientists about the humane treatment of experimental animals: (1) reducing the numbers of animals used for experimentation, (2) unnecessary duplication of experiments, and (3) minimizing pain and distress. Although scientists are proceeding toward a program(s) of self-regulation, this approach will be based on the scientific method and will not satisfy completely the differences between scientific and animal protection groups. Scientists have become concerned with "the moral and ethical responsibility for the humane treatment of animals in experimentation" whereas animal protection groups are concerned with "the moral rights of animals not to be used as subjects for experiments". Nevertheless, we hope that the development of a program of self-regulation by scientists will achieve a balance between scientists and animal protectionists and that it will result in important and constructive interaction between the two groups.

> 'What is to be done? Follow the old well-established rules. The public must be educated. An agitation must be carried on. Scientific men must come freely and boldly forth and make the laity as familiar as possible with their claims, and the reasons urged in support of them.'
>
> *Lancet* ii, 1881[1]

Concerns about the use of animals for research and teaching in the United States have existed since the end of the nineteenth century but have never influenced the future of animal research until the present time. Scientists must now face the possibility that the use of animals for experimentation will be restricted and controlled by legislation in this country. Events leading to this possibility parallel, in many ways, those in 19th century Britain. Table 1 shows the similarities in activities in Britain, which led to the passage of the *Cruelty to Animals Act* in 1876, to activities in the United States through proposed legislation in 1980. Although effective demonstrations against animal experimentation in the United States only began in the 1960's such stormy battles were carried out consistently in Britain from the early 1800's. We can also see that events moved more rapidly in England and certainly influenced events in this country. It is important to compare these events, understand their impact, and to present current attempts to resolve some of the issues.

Table 1

GREAT BRITAIN [2,3]	UNITED STATES [4,5,7]
1824—Royal Society for the Prevention of Cruelty to Animals (RSPCA)	1866—American Society for the Prevention of Cruelty to Animals (ASPCA)
1870—British Association for the Advancement of Science developed guidelines for physiological experiments	1867-1880 Antivivisectionist Bills proposed in N.Y. State Legislature
1875—Royal Commission of Queen Victoria which resulted in the proposal of the "Cruelty to Animals Act"	1883—First Antivivisection Society (Philadelphia)
1876—The "Cruelty to Animals Act" was passed	1960's Animal Rights Organizations
1884—Association for the Advancement of Medicine by Research to administer the 1876 Act	1970's Demonstrations began against animal research by varieties of Animal Protection groups
	1979-1980 Proposed Legislation: HR 4805 Research Modernization Act HR 6847 Revision of Animal Welfare Act

First, let us define the word 'vivisection'. It is given as the "dissection of or a cutting operation upon a living animal" [2] and before 1846 it meant that these procedures were done without the use of anesthesia. After anesthesia was discovered, vivisection was used broadly to mean animal experimentation and was understood to proceed with anesthetised animals. However, the word 'vivisection' still is used by many to exemplify animals suffering excruciating pain and distress during experimentation.

In Britain, concerns about animal experimentation began much earlier than in the United States. Antivivisection and animal protection groups were organized by physicians, scientists and the general public. By 1824 the Royal Society for the Prevention of Cruelty to Animals (RSPCA) was established. Their purpose was to publicize the principle of kindness to animals as well as to enforce existing anticruelty laws and to pass new ones. As its membership increased and social ties strengthened, the RSPCA gained much influence in Britain and eventually became increasingly concerned about painful experiments with animals. After 1857 the Society began to be actively involved in issues of animal experimentation and, with other groups, has since engaged in purposeful activities to stop 'painful' animal research.

By 1870, antivivisection in England had become a raging controversy; antivivisection bills were read in Parliament, public demonstrations against experimentation increased and detailed reports were published by the press. Physicians and scientists became sympathetic to the protests and in 1870 the British Association for the Advancement of Science formed a committee to develop guidelines for conducting physiological experiments, to consider steps to minimize suffering, and to discourage experiments which were not clearly legitimate on live animals. A report was submitted by the committee in 1871. It had four parts:

1. Every experiment that could utilize anesthesia ought to do so.
2. Teaching demonstrations on living animals ought to be painless or to utilize anesthesia.
3. Painful experiments for the purpose of research ought to be performed only by skilled persons with appropriate instruments and facilities in a laboratory 'under proper regulations'.
4. Vivisection ought not to be performed in veterinary education for the purpose of obtaining manual dexterity [4].

Queen Victoria, strongly against vivisection, had for some time been urging her Prime Minister, Disraeli, and the Home Secretary, Cross, to bring some action against animal experimentation [4]. After much correspondence and inquiry, a Royal Commission was established in 1875 to investigate the practices of subjecting live animals to experiments in Britain, the amount of cruelty that might be taking place, and the best means of preventing it [3, 4]. The report of the Royal Commission resulted in the introduction of a bill in Parliament by Lord Carnarvon. The bill, after much lobbying and modification was passed and became the *Cruelty to Animals Act* of 1876. It's main points were:

1. Any person wishing to perform experiments on living vertebrate animals must be licensed, which license must be renewed yearly.
2. Experiments must be toward the end of alleviating suffering; any other purpose (for example, to illustrate lectures) required certification.
3. Experiments on dogs, cats, horses, mules and asses also required special certification.
4. Curare was not considered an anesthetic.
5. No one could be licensed as indicated except by permission of the Home Secretary [5].

It is important to understand the immediate impact of the 'Cruelty to Animals Act' on animal experimentation in Britain. By the time the act was passed it had been watered down, did not really satisfy either side, but was still restrictive. Scientists had to be licensed and licensure was under the control of the Home Secretary. As a result, few licenses were issued and the number of experiments and experimenters in Britain drastically declined. However, this did not end the controversy; more demonstrations against scientists occurred, new antivivisection groups were formed, new bills were proposed in Parliament, and a general campaign began to end all animal experiments.

In 1882 the medical and scientific community, concerned by the drastic decline of research and interference with scientific progress, established the Association for the Advancement of Medicine by Research (A.A.M.R.).*

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* It included an imposing membership: Sir William Jenner (President of the Royal College of Physicians), Sir James Paget, Sir William Gull, Dr Farquharson, M.P., Samuel Wilks, Joseph Lister and Burdon Sanderson. The A.A.M.R. backed research of such scientists as Sir Charles Sherrington and J. Graham Brown.

The objective of the A.A.M.R. was to promote research in order to advance medical theory and practice in a variety of specialities. This involved a careful scrutiny of the operation of the Act of 1876, not with the idea of a repeal but to see to its just administration. The Association endorsed actual research and began to play an important role in representing experimental medicine to the Home Secretary. By 1884, applications for licenses to experiment on living animals had to be recommended by the A.A.M.R. A transfer of decision-making on applications for licenses from the Home Secretary to the A.A.M.R. was effective until 1913 [3, 4].

This administrative transfer radically altered the situation. The A.A.M.R. proceeded to issue licenses to large numbers of qualified investigators. The number of animal experiments in Britain increased significantly and experimental medicine and science soon became dominant in Britain. Therefore, the antivivisectionists, by affecting legislation, did not abolish or even critically limit animal research. Instead, their intense dissatisfaction with the progress they made had the effect of forcing the medical and scientific community to unite and protect science. Nevertheless, the Antivivisectionist movement did raise the consciousness of scientists, the government, and the public about the need for the humane treatment of research animals and the laws passed does give them protection. The 1876 Act has been in effect since that time. However, although there is legislation in Britain, the battle has continued, with current attempts at revision and new legislation.

Let us turn now to developments in the United States.

The first *organized* humanitarian effort in this country came about in 1866 when Henry Bergh founded the first American Association for the Prevention of Cruelty to Animals. These societies were not concerned about the epizootics that occurred in cattle, horses or hogs, or about the lack of shelters for livestock on the midwestern plains. Instead, they wanted to do something about the cruelties that individuals practiced on animals in cities. By 1910, there were 131 anticruelty societies solely for the protection of animals; today there are thousands [6]. These humane societies hold a wide spectrum of attitudes regarding animal experimentation. Some want to decrease the number of animals used for research, while some want to reduce the number of new experiments and hence, the number of animals. Others are concerned primarily with the use of domestic animals for research.

The antivivisection movement in the United States began in 1867 and opposed the use of all animals in research. During that year, an anticruelty bill was presented to the New York State Legislature, but did not pass. In 1880, a second antivivisection bill was proposed and again failed. Had either bill passed, all animal research in New York State would have been halted. Three years later, in 1883, the first Antivivisectionist Society was established in Philadelphia, with the object of restricting and preventing injudicious and needless suffering of animals under the pretense of medical or scientific research [6].

This movement did not gain in strength or membership until the end of the 19th Century. It came about in part from the growing importance of experimental physiology, pathology, and other scientific disciplines in the education of physicians. There were also increasing efforts to have state legislatures and Congress regulate, restrict, or abolish animal experimentation. Other attempts to pass antivivisection bills were made from 1896—1906 in Massachusetts and Pennsylvania but these too consistently failed. Antivivisectionist issues were strongly contested during this period by physicians and scientists who lobbied successfully against restrictive legislation. Benison, in his article *In Defense of Medical Research* [6] describes these efforts. In 1896, Professor Henry Bowditch of Harvard obtained the support of the Massachusetts Medical Society in lobbying against an antivivisection bill. Four years later, Dr William Welch of Johns Hopkins was joined by Drs William Osler, William Keen, Robert Hare, George Sternberg and other prominent physicians and teachers to oppose a bill which would regulate animal experimentation in the District of Columbia. In 1908, following an antivivisectionist attack against Rockefeller University, the American Medical Association organized a Special Defense Committee in Support of Medical Research. Professor Walter B. Cannon served as the chairman of the Committee for 18 years. Benison states, "in truth it can be said that during this period he directed the struggle against antivivisection in the United States". He did not just defend the use of animals for experimentation but affirmed the right of medical research and experimentation. Cannon developed a code of laboratory procedures for medical schools and research institutes to show that scientists were capable of self-policing and rational regulation. He motivated leaders in various medical fields to write papers on the importance of animal research in medical and surgical practice [6, 7].

Cannon fought many wars against the antivivisectionists but did not halt their activities. Today, antivivisection groups are more active and vocal than they have ever been. Within these groups we also find differences. Some antivivisectionists are primarily concerned with abolishing tests of cosmetics and food additives. Others want to end experiments on cats and dogs; and still others want to abolish all animal research.

Animal rights organizations, the most recent to emerge, include both antivivisection and animal welfare groups. Their attitudes range from opposition to all animal experiments based on moral protection and the moral rights of animals not to be used as experimental subjects, to concerns about 'inhumane' experiments and the 'insignificance' of most research.

There is no need to review here all the recent activities and demonstrations against animal research in this country. They have been well publicized and discussed. However, as in England, these events have culminated in the proposals of several bills which were considered by the 96th Congress (1980). There are two major bills which have aroused a great deal of concern and discussion.

The first, H.R. 4805, a major bill sponsored by United Action for Animals, is known as the *Research Modernization Act*. This bill would establish a *National Center for Alternative Research* and receive no less than 30% and no more than 50% of all "appropriations made available to such agency for all research and testing programs conducted or sponsored by such agency involving the use of live animals" and would "eliminate duplication of research and testing on live animals" [8]. While the intent to promote animal welfare is highly commendable, the bill would prohibit the use of funds for animal testing once an alternative is identified by the Center. Results from research and tests, which involve the use of alternatives, are often validated through the use of live animals. It is an essential step in determining possible effects on health and safety. Duplicative research and testing, in which the results of one investigator are confirmed or disproved by another, is an important part of the scientific process.

A 1975 symposium of the National Research Council of the National Academy of Sciences explored ways that statistical and computer technology could be substituted for research with animals. It is noteworthy that the symposium concluded that at the present time there is no adequate substitute for much of the research which requires living systems [9].

The late David Smyth, in a review of alternatives for animal research, supports this view. He adds: "The sitting up of a special institute to develop alternatives would be unlikely to achieve anything useful. Evaluation of the results of such work would require comparison of the new alternatives with existing methods using animals, and such an institute would require a very large animal house and the carrying out of a larger number of animal experiments not directly aimed at solving any medical or scientific problem [10].

Although bill HR 4805 did not pass in the 96th Congress (1980), it will be reintroduced in the next session of Congress. The National Institutes of Health, in response to concerns about the bill, will hold a conference entitled *Trends in Bioassay Methodology:* In Vivo, In Vitro *and Mathematical Approaches* in early 1981. It is assumed that the direction of H.R. 4805, will depend upon the information presented at this conference.

A second major bill. H.R. 6847, introduced by Congresswoman Schroeder of Colorado, would amend the existing Animal Welfare Act. The proposed amendment would add a definition of the word 'pain' as not only "hurtful immediate physical sensations but also debilitation and significant physical and behavioral distress" [11]. It would also delete the provision in the current Animal Welfare Act which exempts the Secretary of agriculture from promulgating rules, regulations or orders concerning the design, protocols or performance of *actual research* or *experimentation*. This could pave the way for the U.S. Department of Agriculture, at the urgence of animal welfare groups, to interfere with the design and management of research activities. Although this bill also failed in Congress, it will probably be reintroduced. The U.S. Department of Agriculture will soon provide a position statement on this proposed legislation to amend the Animal Welfare Act.

The possible consequence of legislation in this country would be first, the external control and restriction of animal research as embodied by H.R. 4805 and H.R. 6847. Legislation in Britain, Scandinavia and other European countries are effective because of the small number of research institutions in each country. In the United States, where there are thousands of research centers and scientists, legislation may be impractical, extremely difficult to implement, and may not be very effective. Should the use of animals for research and teaching be curtailed as a result of hastily conceived legislation, progress in gaining knowledge crucial to human and animal well being would be disrupted. Irreparable damage would result to biological and psychological research and to medical education.

It is evident that the positions of animal protection groups and scientists are now far apart.

Animal protection groups protest that (1) scientists use too many animals, (2) experiments are needlessly repeated and duplicated, (3) results are not significant, and (4) animals are subjected to unnecessary pain and distress. *Scientific* groups state that (1) experimental procedures may cause pain and distress to animals, (2) anesthesia is used whenever it will not interfere with the research. (3) although many experiments are not significant, there is no way of determining this in advance, and (4) duplication and confirmation of experimental phenomena are essential parts of the scientific process [12].

I think we can agree that events here in the United States seem to be at the same level as they were in Britain in 1876, when the Cruelty to Animals Act was proposed and passed. We can also see that animal protection groups here are having the same effect on scientists as they did in Britain in 1876. That is, they have raised, and are continuing to raise, the consciousness of scientists so that they will assume responsibility for the humane treatment of animals and ethical conditions under which experiments are performed. At the same time, animal protection groups are motivating scientists to unite to assure the future of animal research.

Scientists have already made efforts to resolve some of these issues. Scientific societies have revised their "Principles for the Care and Use of Animals", they have changed their animal care committees to include ethical concerns about the use of animals in experimentation, and they have held symposia at their annual meetings* to air both sides of these issues. At many institutions, where animals are used for research or teaching, animal care committees review experimental proposals. Thus, an increasing number of scientists have come to realize that scientists themselves must:

—Develop and implement a set of ethical standards and humane guidelines for the use of animals in research and teaching, and

—Develop an educational program to teach the standards and guidelines to all who will be involved in animal research.

These are the 2 goals of our Committee on Animal Research at the New York Academy of Sciences, which are gaining increasing support of scientific groups.

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* For example—The American Psychological Association held a symposium at their Annual Convention in 1980 entitled 'Ethical Issues in Research in Animals'.

Our project was initiated by a visit to Britain and Denmark to review the principles upon which their animal legislation is based, not for the purpose of encouraging legislation in this country but to identify those principles which would be useful in our program [13].

A program to establish ethical standards and humane guidelines would reflect scientists' concerns about minimizing pain and distress to experimental animals, to reduce where possible the number of animals, and, to avoid unnecessary duplication of experiments. The educational aspect of the program would include the development of a syllabus to teach the standards and guidelines to all students concerned with animal experimentation. It would also create and use alternative teaching methods, where possible, in order to conserve animals.

Since this approach will be based on the scientific method, it will not resolve completely the differences between the positions of scientists and animal protection groups. Scientists are concerned with "the moral and ethical responsibility for the humane treatment of animals in experimentation"; whereas animal protection groups are concerned with "the moral rights of animals not to be used as subjects for experiments".

Should the scientists unite to establish ethical standards and humane guidelines by which to conduct animal research and thus assure the continuity and future of experimentation under scientific control, the animal protection groups may, as in Britain, lose the opportunity for constructive interaction. Nevertheless, we are hopeful that such a program as described here would achieve a balance between scientists, the general public and animal protection groups, and that it will provide a vehicle for important and productive communication [14–16].

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October 14, 1981

Representative Doug Walgren
Cannon House Office Building
Room 117
Washington, D.C. 20515

Dear Representative Walgren:

I understand the Subcommittee on Science, Technology and Research is interested in information dealing with the use of animals in research.

In this Institute we are concerned with the important questions of causes of the premature human killing diseases, especially important forms of cancers.

We learn much through epidemiology as to risk factors for specific cancers.

It is most important to validate such risk factors through laboratory studies. We have developed in this Institute a systematic approach to these questions. Our procedures in the first few steps do not involve animals and, indeed, much can be learned through these advanced in vitro techniques. Even in this case, however, we utilize tissues from animals so that even these in vitro systems require the use of laboratory animals, especially rodents such as mice, rats, or hamsters.

The in vitro systems, however, need further validation as a basis of risk evaluation to man of specific environmental factors. These studies necessarily require the use of animals, again of rodents.

The proper pursuit of these studies requires the acquisition of excellent quality laboratory animals and even more important, their maintenance under conditions of extreme cleanliness, care and proper management in general.

I am pleased to enclose a reprint, a simplified version of this technical paper will appear in SCIENCE of October 23, 1981.

Our staff and I would be delighted to assist you with background information as required.

Sincerely,

John H. Weisburger, Ph.D., M.D.h.c.
Vice President for Research

Carcinogen Testing: Current Problems and New Approaches

John H. Weisburger and Gary M. Williams

Summary. The classic procedures for testing potential carcinogens in animals have basically not changed in the past 50 years. Considerable knowledge of the mechanisms of carcinogenesis has accrued in the last 20 years, particularly concepts on the metabolic activation of chemicals to reactive electrophilic compounds that can interact with nucleophilic cell components including DNA. These developments, in turn, have yielded a framework for integrating into carcinogen testing the determination of genetic effects of chemicals. A systematic decision point approach to carcinogen testing has been developed which entails a sequential decision-making process as specific tests are performed and evaluated prior to initiation of higher order, more complex tests. Compared to conventional bioassays in rodents, this approach provides knowledge based on mechanisms of carcinogenesis, yields a substantial amount of data at minimal cost, and forms a solid base for eventual health risk assessment.

In recent decades, scientists and the public at large have been much concerned with questions on the environmental causation of cancer. Based on the information that chemicals producing cancer in humans also are carcinogenic in animals, animal models were developed to assess potential cancer risks to humans. Initially, such tests were conducted mostly by academic scientists with an interest in structure-activity correlations, using specialized experimental assays. Later, certain testing approaches were elaborated and standardized before their limitations were apparent and before the mechanisms of carcinogenesis were adequately understood.

Difficulties with Current Approaches to Carcinogen Testing

The standard typical bioassays for the detection of chemical carcinogens as developed by the National Cancer Institute (NCI) requires the use of male and female rats, mice, and occasionally hamsters of strains selected for their sensitivity to carcinogens (*1*). The standard test involves determination of the maximally tolerated dose (MTD) of a product, after which, groups of 50 male and female animals are given the MTD and half-MTD in a 2-year test and, in some instances, a lifetime test. The animals are then examined postmortem with an extensive review of their tissue pathology, and the incidence of neoplasms in the experimental groups is statistically evaluated in comparison with control groups.

Such testing requires not only large resources in time and money but also scarce specialty skills such as veterinary medicine and pathology for reliable execution. Since the time these tests were first developed, largely by the NCI, other organizations such as the Food and Drug Administration, Environmental Protection Agency (EPA), Consumer Protection Safety Commission, Occupational Safety and Health Administration, and National Toxicology Program (NTP) have emerged to require as part of their mission specific additional tests and expanded data. When the NCI began carcinogen screening programs in 1962, a test of a given chemical performed in one species took as little as 8 months and cost about $10,000 to $15,000. Ten years later a more extensive test in two species with larger numbers of animals required about 30 months and cost about $75,000. Now, another 10 years later, tests of a chemical for multiple observational end points require even larger resources, more time (up to 64 months), and as much as $300,000 to $500,000 (*2*).

The results for approximately 245 chemicals tested by standardized procedures have been published as NCI or, more recently, as NTP reports. For these chemicals, 32 tests were judged inconclusive and 23 equivocal (*3*). A number of tests gave borderline results that presented statistical difficulties, and without additional data points and mechanistic understanding they were subject to much subjective and even controversial interpretations.

Animal bioassays by themselves can yield ambiguous results, especially in relation to human risk assessment. In the past it was the practice to take the data at face value. When an experiment yielded a statistically significant excess of cancer in the test series compared to the controls the test substance would be labeled a carcinogen, and regulatory agencies would be inclined, or indeed forced, to take appropriate steps to remove such a product or otherwise protect potentially exposed individuals. This approach is justified with agents that are obviously carcinogenic, such as those yielding a high incidence of cancer at a given site in several species in a short time. In fact, most known human carcinogens do exactly that, and thus, in order to define human risk, relatively little additional information may be needed for such compounds.

A variety of chemicals, however, yield less definitive evidence upon testing but nevertheless have been represented as being human cancer risks (*4*). For example, amaranth (FD&C Red Dye No. 2) seemed to yield a statistically significant incidence of total tumors in female rats (but not in male rats) in the absence of an increase at any specific site. Nitrite was reported to increase slightly the incidence of spontaneously arising splenic sarcomas in rats. With high levels of saccharin, evidence of carcinogenicity was seen in small numbers of rats in a two-generation test. Thus, amaranth was banned in the United States (but not in other countries), and regulatory actions were formulated but not implemented for nitrite and saccharin.

Moreover, a substantial portion of the chemicals tested under the NCI protocols, especially those belonging to the class of halogenated hydrocarbons, produced an increase in the incidence of liver tumors that have a 20 to 40 percent spontaneous occurrence in the mouse

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strains used, but had no other major carcinogenic effect (*5*). The significance and interpretation of this finding, in particular, should be viewed together with collateral evidence on the possible mode of action of this group of chemicals.

In an effort to provide a comprehensive overview of chronic toxicity and carcinogenicity, more complex and expensive bioassays were developed. Even so, some of these bioassays have yielded false negative results. A recent example is the NCI testing of vinylidene chloride, which was reported to be inactive. In a smaller, earlier test series, this chemical yielded distinct positive results and was also mutagenic (*6*). The negative result in the large-scale bioassy therefore requires an explanation; furthermore, it indicates the need for a more systematic approach to carcinogen assays in order to avoid such problems.

Another consideration of increasing importance is the ethics of routinely using large numbers of animals in testing programs when other approaches are available to delineate hazard. The concern of the public with this issue is reflected by the reintroduction in the 1981 Congress of bill H.R. 556 which is intended to establish a National Center for Alternative Research to develop and coordinate alternative methods of research and testing that do not require the use of live animals.

Chemical Carcinogenesis

For the interpretation of animal studies, an operational definition of a carcinogen is applied to any chemical or product that under the conditions of the test leads to a statistically significant increase in neoplasms in specific target organs (*7*). The general use of this operational definition requires reevaluation in the context of the sizable advances in knowledge of the mechanisms of carcinogenesis that have occurred during the last 20 years.

Research on the correlations between structure and activity and related approaches led to the discovery of a great variety of chemical carcinogens. Although some of these carcinogens had totally different structures, they affected the same target organ. For example, the mold toxin aflatoxin B_1, the plant product safrole, the synthetic chemicals 4-dimethylaminoazobenzene, 2-acetylaminofluorene, and dimethylnitrosamine all caused liver cancer when administered under suitable conditions to laboratory rodents such as mice, rats, or hamsters; in addition, some of these carcinogens were active in larger animals such as dogs or monkeys (*8*). Since the agents mentioned caused cancer at points remote from the point of application, it seemed logical that they required some form of metabolism in the target organ. This, in turn, led to research on the metabolism and mode of action of typical chemical carcinogens.

Thus it was found that pro- or precarcinogens, or indirectly acting carcinogens, were converted to a more active agent, the proximate carcinogen, which in turn was further metabolized to the ultimate carcinogen (*7*). The last agent could interact directly with the critical targets in the cell initiating a sequence of steps leading to cancer. Synthetic, direct-acting carcinogens have such properties inherent in their structure. The ultimate carcinogens are electrophilic reactants, a concept generalized by the Millers (*9*). Such products possess a positive charge that can react covalently with the nucleophilic components in cells, among which the genetic material DNA has emerged as potentially the most significant (*10*). This, in turn, led to an association between carcinogenicity and mutagenicity.

The correlation between mutagenicity and carcinogenicity was greatly expanded when Ames and co-workers (*11*) introduced the use of histidine-requiring mutants of *Salmonella typhimurium* for detecting mutagens and carcinogens. The need for mammalian enzyme activation systems was met by adding a subcellular fraction (S-9) of liver, consisting of microsomes and a soluble fraction obtained by sedimentation of a rodent liver homogenate at 9000*g*. The fraction functions well, but is metabolically different from a whole liver cell in vitro and even more so from liver in vivo (*12*). In particular, S-9 is deficient in enzymes that yield conjugated metabolites and possesses different ratios of specific metabolizing enzymes including the cytochrome systems. This accounts for certain quantitative but usually not qualitative differences between mutagenic activity and carcinogenicity. The failure to detect mutagenicity with known carcinogens in vitro frequently hinges on deficient conversion, by the biochemical activation system used, of the promutagen to the ultimate electrophilic form. Modification of the activation steps often leads to a resolution of the differences observed. At the same time that reliable microbial systems were being developed (*13*), a variety of other short-term tests were introduced that extended knowledge of the mutagenic effects of carcinogens (*14*).

There are several exceptions to the correlation between mutagenicity and carcinogenicity. For example, DDT and other chlorinated hydrocarbons, hormones such as diethylstilbestrol and even naturally occurring estrogens, and drugs such as phenobarbital caused tumors in classic animal bioassays yet were uniformly inactive in mutagenicity tests (*15*). By the operational definition discussed above, all such compounds would be called carcinogens, yet, just as the concept of electrophilic reactants has proved useful in following through the many structural types of organic carcinogens, it seems clear that additional mechanistic concepts will have to be developed for these other carcinogens.

The decision as to whether a chemical has the potential for interaction with genetic material, that is, has genotoxic properties, can be made qualitatively on the basis of several criteria: (i) a reliable, positive demonstration of genotoxicity in appropriate prokaryotic and eukaryotic systems in vitro; (ii) studies on binding to DNA; or (iii) evidence of biochemical or biologic consequences of DNA damage (*16*). Genotoxic chemicals appear to exert their effects by interacting directly, or after conversion to an ultimate carcinogenic form, with DNA. In a quiescent nonduplicating cell this DNA can be repaired. However, duplication of a cell with modified DNA results in mispairing of bases and gives rise to progeny with an abnormal genome corresponding to what is commonly called the dormant or latent tumor cell. Under permissive conditions, such abnormal cells can proliferate and give rise to a neoplasm.

In contrast to genotoxic carcinogens, certain hormones, chlorinated hydrocarbons such as DDT, and phenobarbital exert their carcinogenic effects through incompletely known mechanisms that might best be called epigenetic interactions. Evidence indicates that epigenetic agents require an antecedent change in the mammalian genome. By themselves, epigenetic agents presumably are incapable of causing conversion of a normal cell to a neoplastic one but permit the expression of preexisting latent neoplastic cells. In such instances where the induction of neoplasia by an epigenetic agent might have occurred, it is essential to determine what possible other antecedent reaction might have led to the gene change.

On the basis of these differences in carcinogenic mechanisms, carcinogens can be classified into two broad types, genotoxic and epigenetic, and further divided into eight subclasses of compounds (Table 1) (*16*). Experimental sup-

Table 1. Classes of carcinogenic chemicals. From data in (*6*).

Type	Mode of action	Example
	Genotoxic	
1. Direct-acting	Electrophile, organic compound, genotoxic, interacts with DNA	Ethylene imine
2. Procarcinogen	Requires conversion through metabolic activation by host or in vitro to type 1	Vinyl chloride, benzo[*a*]pyrene, 2-naphthylamine, dimethylnitrosamine
3. Inorganic carcinogen	Not directly genotoxic, leads to changes in DNA by selective alteration in fidelity of DNA replication	Nickel, chromium
	Epigenetic	
4. Solid-state carcinogen	Exact mechanism unknown; usually affects only mesenchymal cells and tissues; physical form vital	Polymer or metal foils; asbestos
5. Hormone	Usually not genotoxic; mainly alters endocrine system balance and differentiation; often acts as promoter	Estradiol, diethylstilbestrol
6. Immunosuppressor	Usually not genotoxic; mainly stimulates "virally induced," transplanted, or metastatic neoplasms	Azathioprine, antilymphocytic serum
7. Cocarcinogen	Not genotoxic or carcinogenic, but enhances effect of type 1 or type 2 agent when given at the same time. May modify conversion of type 2 to type 1	Phorbol esters, pyrene, catechol, ethanol, *n*-dodecane, SO_2
8. Promoter	Not genotoxic or carcinogenic, but enhances effect of type 1 or type 2 agent when given subsequently	Phorbol esters, phenol, anthralin, bile acids, tryptophan metabolites, saccharin

port for this classification is growing, and similar concepts have been adopted by national policy groups (*17*). The recognition of multiple modes of action for carcinogens has major implications for the design of test procedures and for the interpretation of results.

In this article we describe a decision point approach to delineating possible human carcinogenic and mutagenic risks. This approach utilizes the major advances in knowledge of the mechanisms of carcinogenesis to provide reliable and economic methods for the testing of carcinogens.

The Decision Point Approach

An essential feature of the decision point approach to carcinogen testing is that the sequence of tests is such that the results can be evaluated at certain key points in the test series and decisions made regarding the potential carcinogenicity of a given chemical (Table 2).

The concept of diverse mechanisms of action is addressed in the decision point approach in two ways: (i) by using a battery of short-term tests to detect agents operating through genotoxic mechanisms and, in some instances, by epigenetic mechanisms; and (ii) by using a systematic approach that provides a guide to minimal testing but takes into account the possibility that testing for periods other than long-term may not detect chemicals that induce tumors in animals only under specific conditions after prolonged administration.

The use of a carefully chosen battery of short-term tests may either eliminate the need for further testing of the chemical or enable the verification of carcinogenic potential in one of five limited bioassays in vivo. This test battery can also add essential data for risk evaluation when an already completed series of long-term tests has yielded ambiguous results.

The decision point approach, therefore, provides a framework in which to minimize and optimize the necessary testing and at the same time develop an understanding of the mechanism of action of a test chemical (Table 2). At the end of each phase, the significance of the data in relation to the testing objective is critically evaluated and assessed. A decision is made as to whether the data available are sufficient to reach a definitive conclusion or whether a higher level of tests is required. Attention is paid to qualitative—yes or no—answers, and to semiquantitative—high, medium, or low—effects. Since the value and implications of each test have been described (*16*), we discuss here only the essential details of the sequence.

Stage A. Structure of the chemical. The evaluation starts with a consideration of the structure of a given chemical, with particular regard to its potential for activity as an electrophilic reactant either in its present form or after metabolism. For chemicals with structures related to known carcinogens that form electrophiles, structure-activity correlations can be estimated with fair success within several structural classes (*8*, *18*).

Stage B. Short-term tests in vitro. This stage of testing is aimed primarily at detecting genotoxins and thus utilizes a battery of short-term tests in vitro, most of which identify genetic effects. Additional tests sensitive to epigenetic carcinogens will have to be developed (*19*).

Multiple tests in vitro are necessary (*20*) because no single test has detected all the known genotoxic carcinogens. The critical issue in structuring such a battery is to define the criteria for selection of appropriate tests. Moreover, since testing is becoming more complex and expensive, it is important to reduce the number of tests to an essential core.

Criteria for a Battery of Short-Term Tests

Data from several key tests are needed before a decision can be made on the potential hazard of a chemical. A battery corresponds to the initial "detection" phase used in most tier approaches to testing. However, the main difference between a battery and the tier approach is that a battery combines "detection" and the next step of a tier, "confirmation," in one stage. Inherent in this approach is the recognition that current short-term tests may yield false positive or false negative results. Thus, parallel simultaneous results are essential for judicious interpretation. The battery approach requires that no conclusion should be drawn or decision made without the data from the entire battery being considered.

Test batteries for carcinogenicity can be validated against data in vivo. The EPA Gene-Tox program, which is currently evaluating short-term tests with reference to carcinogenicity data, should provide important information on this subject. Thus far 23 systems have been evaluated and the assessments of seven are to be published in *Mutation Research* [see (*20*)]. A similar effort is being made by the International Commission for Protection Against Environmental

Mutagens and Carcinogens (ICPEMC) (*20*).

Table 2. Decision point approach to carcinogen testing. Modified from data in (*16*).

Stage A. Structure of chemical
Stage B. Short-term tests in vitro
  1. Bacterial mutagenesis
  2. Mammalian mutagenesis
  3. DNA repair
  4. Chromosome tests
  5. Cell transformation
Decision point 1: Evaluation of all tests conducted in stages A and B
Stage C. Limited bioassays in vivo
  1. Skin tumor induction in mice
  2. Pulmonary tumor induction in mice
  3. Breast cancer induction in female Sprague-Dawley rats
  4. Altered foci induction in rodent liver
  5. Assays for promoters
Decision point 2: Evaluation of results from stage A through all the appropriate tests in stage C
Stage D. Long-term bioassay
Decision Point 3: Final evaluation of all the results. This evaluation must include data from stages A and B to provide basis for mechanistic considerations

Because oncogenic mechanisms of a nongenetic nature are clearly not detectable in tests measuring a genetic end point, it is important that chemicals operating by indirect epigenetic mechanisms should not be expected to be positive in short-term tests; neither should the results for these chemicals in short-term tests be considered "false negatives." Rather, the short-term tests provide useful information on the mechanisms of action of the chemical, which must be taken into account in risk evaluation.

Some results observed, such as malignant transformation and sister chromatid exchange (SCE), may be caused by events other than a direct attack on DNA; such reactions may be indicative of non-DNA–damaging carcinogens. Efforts are under way to develop tests in vitro for tumor promoters (*19*), but the data available are not sufficient to justify routine inclusion of such tests in a battery. Therefore, in using batteries for the detection of carcinogens it must be recognized that a whole category of chemicals that operate by nongenetic mechanisms, such as saccharin, hormones, bile acids, certain organochlorine compounds and pesticides, and miscellaneous pharmaceuticals, will not be detected.

More than 100 short-term tests are available, but most tiers or batteries center around seven systems: bacterial mutagenesis, eukaryote mutagenesis, *Drosophila* mutagenesis, mammalian cell mutagenesis, DNA damage, chromosome damage, and malignant transformation. The design of a battery should consider certain key principles. First, the end points of the tests should be reliable and have clear biologic significance; that is, they should actually determine what they are supposed to measure, and should have conceptual relevance to mutagenicity or carcinogenicity. Second, a battery should optimize the metabolic reactions underlying all tests. Thus, tests with intact cells would extend the metabolic capacity of the commonly used enzyme preparations, since the latter often cause an artifactual enhancement of activation over detoxification reactions (*12*). Several national and multinational testing programs, particularly a program in Japan (*21*), are now making effective use of test batteries in vitro.

Essential components of a test battery are the microbial mutagenesis tests, developed mainly by Malling, deSerres, Ames, Rosenkranz, Matsushima, and Sugimura, because these are the most sensitive, effective, and readily performed screening tests available thus far (*11, 13*). In deciding what other tests should be included, it is essential to consider metabolic capability, reliability, and biologic significance of the end point.

Tests for mutagenesis systems in mammalian cells were developed primarily by the groups of Szybalski, Chu, and DeMars [see (*22*)]. Such tests are required in a battery because they provide definitive end points similar to those provided by tests for bacterial mutagenesis but involve the more highly organized eukaryotic genome (*22*).

Damaged DNA or altered chromosomes provide evidence that a chemical can change genetic material. Indicators for DNA damage that have been proposed include DNA binding, DNA fragmentation, inhibition of DNA synthesis, and DNA repair (*23*). Of these, DNA repair is a specific response to DNA damage which is simple to measure and, unlike DNA fragmentation and inhibition of DNA synthesis, cannot be attributed to toxicity. Thus, a DNA repair test provides an end point of high specificity and biologic significance.

A chromosomal test is included to detect effects at the highest level of genetic organization. Such tests, however, may respond to nongenotoxic agents through effects on DNA replication or chromosome separation, for example. Sister chromatid exchange can be readily monitored and is therefore recommended as a chromosome test (*24*). Use of this test will extend the data base and provide a further basis for judging the value and limitations of this test.

A test for cell transformation [see authors cited in (*25*)] is considered for inclusion in the battery because such transformation may be directly relevant to carcinogenesis. The first reliable system for detecting chemical transformation of cultured mammalian cells was introduced by Sachs and associates. Their system utilizing hamster fibroblasts was subsequently developed into a colony assay for quantitative studies by DiPaolo and has been adapted as a screening test by Pienta. In addition, a quantitative focus assay for transformation in mouse cells has been devised in the laboratory of Heidelberger, and a quantitative assay for growth of BHK cells in soft agar has been developed by Styles. The correlation between transformation and malignancy appears to be good in these systems, but the high frequency of transformation is of concern. Moreover, transformation assays are difficult, less widely available than other systems described, and have given positive results with chemicals not likely to have genotoxic properties. Therefore, at present we recommend performance of the first four tests and use of a transformation assay only if the results of this battery require amplification.

Short-Term Tests Selected

Bacterial mutagenesis. Because of the extensive data base and good correlation with carcinogenicity, the Ames test (*11*) in its recent versions, including liquid-phase incubations, is recommended as the first choice for a bacterial mutagenesis test (*13*).

Genotoxic metabolites may be excreted in urine or stool which can be examined in the Ames test as an indication of such products formed in vivo.

Mammalian mutagenesis. The best characterized mutational system in mammalian cells is mutation at the hypoxanthine-guanine phosphoribosyl transferase locus which can readily be measured by conversion of cells to resistance to toxic purine analogs. The target indicator cells used in purine analog resistance assays have almost all been fibroblast-like, such as the V79 and CHO lines that possess little ability to activate carcinogens. This deficiency is met by either cocultivated cells or enzyme preparations. The CHO system has been extensively validated by Hsie and co-workers (*22*). Mutations can be induced in liver epithelial cultures by activation-dependent carcinogens; hepatocyte-mediated mutagenesis of several cell types including human cells has been described (*26*). These systems, therefore, may provide useful approaches to monitor the generation of mutagens through intact cell metabolism.

DNA repair. Of the systems available, the use of hepatocyte primary cultures for the DNA repair test developed by Williams [see (*27*)] has proved sensitive and reliable with activation-dependent procarcinogens, including some not readily detected in other systems. This test is considered an essential component of the battery, particularly since cells with intact metabolism are used.

Chromosome tests. As with the mammalian mutagenesis tests, SCE assays generally involve cell types that require addition of an exogenous metabolizing system for biotransformation. The best validated system at present is that in which CHO cells are used, but the recent development of liver cell systems with intrinsic metabolic capability promises to provide an important adjunct (*24*).

Cell transformation. Most transformation assays involve fibroblasts and measure a morphological alteration in the cells. Assays for changes in growth properties related to neoplasia, such as growth in soft agar as used by Styles [see (*25*)], and incorporation of more relevant cell types such as epithelial cells are desirable. The systems of Pienta and of Heidelberger appear to be sufficiently widely used to be considered as potential supplements to the other four tests if deemed necessary (*25*).

Decision Point 1

The six steps (stage A plus steps 1 to 5 in stage B) are the basis for preliminary decision-making (see Table 2).

If definite evidence of genotoxicity in more than one test has been obtained, a chemical is highly suspect. In particular, because of their complementary nature, positive results in the test systems of Ames and of Williams provide strong and possibly certain evidence of carcinogenicity. Since there is some redundancy between bacterial and mammalian mutagenicity, these two systems support rather than extend the significance of positive results. An agent that is mutagenic, DNA damaging, and clastogenic is certain to be carcinogenic and represents an unequivocal toxic hazard.

In contrast, genotoxicity in only one test requires interpretation with caution. For example, several types of chemicals such as intercalating agents are mutagenic to bacteria but not reliably carcinogenic. Positive results have also been obtained in bacteria with synthetic phenolic compounds or natural products with phenolic structures such as flavones. In vivo, such compounds are conjugated and excreted readily. Their carcinogenicity in vivo thus depends on the conjugate being split, which is more likely to occur in coprophagic laboratory rodents than in humans, because of the sizable microflora in the upper gastrointestinal tract of rodents. Therefore, positive evidence of bacterial mutagenesis must be evaluated with regard to chemical structure and metabolism. Similarly, positive results only for mammalian mutagenesis or SCE must be interpreted with caution. However, evidence of DNA damage in the hepatocyte repair test strongly indicates covalent binding to DNA, an established property of carcinogens and mutagens.

A wide variety of organic chemical structures capable of forming a reactive electrophile have been carcinogenic in limited bioassays in vivo (*16*). Other substances, such as solid-state materials, possibly some metal ions, hormones, and promoters, which are negative in tests for genotoxicity, operate by complex and poorly understood mechanisms. Rapid bioassay tests for metal ions could be based on the concept proposed by Loeb and co-workers [see (*28*)] that such ions interfere with the fidelity of enzymes performing DNA synthesis. Chemicals with hormone-like properties, in addition to the natural androgens and estrogens, are potential cancer risks mainly because they affect normal physiological endocrine balances (*16*), but there are no rapid tests for such promoting properties and either specific promotional assays (see Table 2, stage C) or the standard long-term bioassay (stage D) are necessary. Potential promoters could be detected through systems in vitro (*19*) or in vivo by treating animals with a limited amount of a genotoxic carcinogen for a specific target organ (stage C). Most promoters affect one tissue in particular and thus require specialized procedures.

Any positive results of the test battery in vitro can be extended through limited bioassays in vivo (stage C) without the need to conduct a full-scale, costly, and time-consuming long-term bioassay. If all the preceding test systems yield no indication of genotoxicity, however, the priority for further testing depends on two criteria: (i) the structure and known physiological properties (for example, hormone) of the material and (ii) the potential for human exposure to the compound. If substantial human exposure is likely, careful consideration should be given to the necessity for additional testing. The chemical structure and the properties of the material provide obvious guidance on proper course of action.

Stage C. Limited bioassays in vivo. This stage of test development is designed to yield further evidence of the potential carcinogenicity of genotoxic chemicals without the necessity for undertaking a long-term bioassay. The tests recommended are those that will provide definitive evidence of carcinogenicity, including cocarcinogenicity and promotion, in a relatively short period (40 weeks or less). Unlike the tests in vitro, these are not applied as a battery but rather used selectively according to the information available on the specific properties of the chemical. These tests have been discussed in detail (*16*) and are summarized here.

Bioassays Selected

Skin tumor induction in mice. The carcinogenicity of a limited number of chemicals and crude products can be revealed readily upon continuous application to the skin of mice, in which they produce papillomas or carcinomas, or upon subcutaneous injection, when they may yield sarcomas. The activity of such compounds as initiating agents can be rapidly determined by the concurrent or sequential application of a promoter such as phorbol ester.

Pulmonary tumor induction in mice. Induction of lung tumors in specific, sensitive mouse strains was developed as a bioassay by Shimkin (*29*). Results are expressed as percentages of animals with tumors compared to controls, and the multiplicity of tumors is an additional indication of potency. Most chemicals active in this system are also carcinogenic in other longer-term animal tests. A negative result does not signify safety since not all classes of chemical carcinogens induce lung tumors.

Breast cancer induction in female Sprague-Dawley rats. Some chemicals rapidly induce cancer in the mammary gland of young female Sprague-Dawley rats (*30*). In this test also, a positive response has usually been confirmed in long-term tests, but a negative response does not prove lack of carcinogenicity.

Altered foci induction in rodent liver. Several distinct hepatocellular lesions regularly precede the development of hepatocellular carcinomas in rats. The earliest of these, the altered focus, can be visualized in routine histologic tissue sections by sensitive histochemical techniques, including reactions for the enzymes γ-glutamyl transpeptidase, glucose-6-phospatase, and adenosinetriphosphatase; resistance to iron accumulation; and resistance to the cytotoxic effect of carcinogens (*31*). In mice, hepatomas can be induced rapidly but may result from an epigenetic effect.

Assays for promoters. In addition to providing further evidence of genotoxicity, limited bioassays in vivo can also be used to test for promoting substances. A genotoxic carcinogen that is active at a specific target organ, such as mouse skin, breast, colon, urinary bladder, or liver, is applied in small initiating doses, after which the test compound is administered. The liver of certain commonly used mouse strains reacts in this test as if it already has an abnormal genome, and thus responds positively to promoters for liver carcinogenesis.

Decision Point 2

The presence of positive results in two or more of the rapid tests in vitro together with a definite positive result in the limited bioassays in vivo would make a product highly suspect as a potential carcinogenic risk to humans. This is especially true if the results were obtained with moderate dosages. In addition, convincing evidence would be a finding of a good dose response, particularly with respect to the multiplicity of lung or mammary gland tumors, and positive results for mutagenicity and DNA damage.

The demonstration of promoting activity in any of the modified assays in the absence of genotoxicity indicates that the chemical deserves investigation as an epigenetic agent.

Stage D. Long-term bioassay. The long-term bioassay is used as a last resort for confirming questionable results in the more limited testing or evaluation of compounds that are inactive in the preceding stages, but where extensive human exposure is likely. Long-term bioassays would also develop data on possible carcinogenicity through epigenetic mechanisms. In the latter situation, multispecies and dose response data are most important if the data are to be applied to safety evaluation. The elimination of unnecessary long-term testing for all chemicals by the decision point approach makes more extensive testing of suspected epigenetic agents economically feasible. Methods for conducting long-term bioassays have been reviewed (*1, 16*), and we need only emphasize here that expert judgment is required for design of the test procedures as well as for reliable evaluation and interpretation of the results.

Decision Point 3

Long-term bioassays as an end point in the decision point approach should yield definitive data on carcinogenicity provided the bioassays are properly conducted. Nonetheless, the results of the short-term tests in vitro must be taken into account for an assessment of mechanisms of action and extrapolation of risk to humans. Thus, convincing positive results in the tests in vitro together with documented carcinogenicity in vivo permits classification of the chemical as a genotoxic carcinogen. Such a chemical would have properties typical of other genotoxic carcinogens, namely, the ability under some conditions to be effective as a single dose, cumulative effects, and potential additive effects or synergism with other genotoxic carcinogens. If there is no convincing evidence of genotoxicity, but nonetheless an indication of carcinogenicity in certain animal bioassays, the chemical may be an epigenetic carcinogen. The reliability of this conclusion depends on the relevance of the tests in vitro. For example, the fact that some stable organochlorine pesticides do not show genotoxic properties in liver culture systems which represent the target cell type in vivo is substantial evidence for an epigenetic mechanism of action. Epigenetic mechanisms are poorly understood and are probably distinct for different classes of carcinogens; for example, they may involve long-term tissue injury, immunosuppressive effects, hormonal imbalances, stimulation of cell proliferation, release of existing altered cells from growth control, or other processes not yet known. Most epigenetically [illegible] agents are active only at high, sustained doses and, up to a certain point, the effects they induce are reversible. Thus, these types of agents may represent only quantitative hazards to humans, and it may be possible to formulate safe levels of exposure after appropriate toxicologic dose-response studies are conducted.

Conclusions

We have developed a decision point approach to the testing of potential carcinogens. This approach is based on the mechanistic classification of chemical carcinogens, whether they be synthetic industrial chemicals or naturally occurring products, into two broad classes—genotoxic and epigenetic—and depends on results obtained from a battery of tests conducted in a logical sequence. The sequence of tests is such that at a number of key points decisions can be made regarding the carcinogenic or genetic risk of a given material. It is sometimes possible to obtain definitive information early in the test series and to avoid the necessity for further time-consuming bioassays that can cost several hundred thousand dollars. This approach, which is based on contemporary concepts of the mechanisms of carcinogenesis and is thus buttressed by a strong collateral research base, is well suited for integration into a broader toxicological evaluation of chemicals (*32*). However, the demonstration of carcinogenicity would for most purposes obviate the need for other types of toxicity testing, because carcinogenicity can usually be shown with lower doses of a genotoxin than are required for the demonstration of other toxic effects.

Because the decision point approach is based on a mechanistic understanding of carcinogenesis, and does not depend on the mere performance of routine bioassays that have changed little in the past 50 years, the results obtained are of greater value in expanding our knowledge of carcinogenic processes. A further advantage of the decision point approach is that nongenotoxic chemicals that are selected for bioassay because of concern for human exposure can be tested over a more extensive dose range to delineate dose-response characteristics and possibly identify thresholds. While the methods basically yield qualitative answers in detecting and classifying carcinogens and mutagens, application to health risk analysis necessarily requires consideration of relative potencies and other quantitative aspects (*16, 33*).

An essential adjunct to the adoption of the proposed new approach to carcinogen testing is a more informed process of data analysis. The best effort in data analysis is now provided by the International Agency for Research on Cancer (IARC) through its monograph series *Evaluation of the Carcinogenic Risk of Chemicals to Humans*. Such efforts should be expanded to incorporate all relevant data collected by individual national groups into the evaluation of chemical hazards and to make possible the adoption of uniform standards of safety worldwide. The International

Commission for Protection Against Environmental Mutagens and Carcinogens is currently working toward several of these goals.

Clearly, it is time to use fundamental knowledge in improving the technology and science of mutagen and carcinogen testing.

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PURDUE
UNIVERSITY OFFICE OF THE VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

December 8, 1981

Representative Doug Walgren
117 Cannon House Office Building
Washington, D. C. 20515

Dear Representative Walgren:

We in the scientific community are continually looking for new approaches, procedures and techniques to improve all aspects of our research effort. Through the years, much progress has been made in efficient and humane use of animals in this overall endeavor. Recently introduced bills in Congress (HR-556, HR-220, HR-930 and HR-2110) aimed at developing "Alternatives to Using Animals in Research" fail to recognize many facts, some of which are enumerated below:

1. For many years the U.S.A. has led the world in research results relative to human and animal health, behavior and production.

2. This research is very competitive and requires a constant updating of procedures and techniques for the individual, group or discipline to progress.

3. This is being accomplished within the present system whereby the individual, group or discipline has the freedom to use the technique deemed most likely to provide the correct answer.

4. Forcing or legislating a new approach to this problem solving would be disastrous to both the researcher and the public which he or she serves. Thus, it would be counter productive in several ways.

5. An overwhelming preponderance of evidence points to the fact that live animal research should be increased rather than diminished.

6. *In vitro* techniques, mathematical models, etc., will continue to grow in effective use and certainly have the blessing of Purdue University and other reliable research communities.

7. New knowledge continues to show increased complexities in biological systems, some known and many unknown.

8. Research will never reach the "state of refinement" whereby all of the pertinent animal variables can be incorporated into an *in vitro* system or into a mathematical model. In fact, each new piece of knowledge further illustrates the complexities of biological systems and that the animal must remain the model of choice.

In summary I would assert that there is no evidence whatsoever that my research colleagues who use animal models in their research are, as a group, other than humane. They use the most effective scientific methods available, and their peer review is the most effective guarantee that all animal scientists will try to be sensitive and parsimonious in their use of non-human species.

In addition, you may be interested to know that we at Purdue are setting up a Center for Ethology and Human-Animal Relations which will provide a forum where veterinarians, animal scientists, psychologists, and philosophers can reinforce their continuing concern for the ways Mankind should interact with the other animals we use for food, or research, or companionship. It is notable that the impetus for this development came spontaneously from colleagues who have a practical rather than a merely theoretical involvement with animals. This is striking testimony to the alertness which all reputable animal scientists have to the use of research animals.

Yours sincerely,

Struther Arnott

Struther Arnott
Vice President and Dean

SA:mg

cc: Representative Floyd Fithian
Senator Richard Lugar
Senator Dan Quayle

October 13, 1981
10416 Rockville Pike #301
Rockville, Md. 20852

The Honorable Douglas Walgren, Chairman
Subcommittee on Science, Research, and Technology
2319 Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Walgren:

This letter is written in regard to the use of animals for medical research.

I am a graduate student at the Uniformed Services University in Bethesda, Md. My experience in research, as a technician and graduate student for eight years, has with rats, mice, and cats. This has included drug screening studies, with mice and rats, which required using very large numbers of animals given acutely toxic (with some very unpleasant reactions) and chronic subtoxic doses.

My graduate studies, at two different schools, have been in the area of cellular physiology. This work involved the use of live animals, but primarily as donors of tissue to be analyzed biochemically.

It seemed that all of the basic research designs of these projects was warranted given the current technology.

The proposed legislation, HR 556, would be a good step, I think, towards encouraging alternative technology. However, in vivo experiments are necessary in many fields of research, because in vitro methods, math models, etc. are not always good predictors of what will happen in the intact organism.

Concerning section 12 of this bill, it is unclear to me whether this means that 30-50 % of all federal money which was spent for live animal work in ie. 1981 (but not that which was already devoted to application of alternative methods) would be diverted to development of alternative methods. If so, I wonder whether this percentage is too high and also wonder whether the same percentage should be mandated for alternative methods for all agencies.

Sincerely,

Carol Starcher

Carol Starcher

Cc. Congressman Michael Barnes (Md.)

STANFORD UNIVERSITY MEDICAL CENTER

STANFORD, CALIFORNIA 94305 • (415) 497-6254
(415) 497-6051

STANFORD HEART DISEASE PREVENTION PROGRAM
730 Welch Road
Palo Alto, California 94304

October 6, 1981

Congressman Doug Walgren (D, PA)
House Office Building
Washington, D.C. 20515

Dear Chairman Walgren:

I should like to thank you for scheduling hearings on seven bills relating to the treatment of laboratory animals and alternatives to their use.

As a medical scientist, may I urge you to move towards effective legislation to require careful consideration of all protocols involving experimental animals in order to prevent suffering to the greatest extent possible.

I believe that the most relevant, cost-effective medical research in many areas involves research on humans rather than animals. Where animals must be involved, the most humanitarian principles should be applied. Compassion for animals is one of the best tests of civilized behavior, simply because we are generally not required to exercise it, and usually do not suffer if we do not.

Sincerely,

Peter D. Wood.

Peter D. Wood, D.Sc.
Adjunct Professor of Medicine
Deputy Director, Stanford Heart
Disease Prevention Program

PDW:pjm

OCT 13 1981

October 6, 1981
East 3907 11th Avenue
Spokane, WA 99202

The Honorable Doug Walgren, Chairman
House Subcommittee on Science, Research, & Technology
United States House of Representatives
Washington, D.C. 20515

Dear Representative Walgren:

Please include this correspondence in the official records of the hearings which your Subcommittee is to hold regarding the use of animals in medical research and testing.

We are ardently opposed to the use of animals in medical research which is characterized by painful experimentation and is tantamount to sanctioned torture. Our opposition is most fervent in those cases which involve federal funding and see a portion of our tax dollars used to such a cruel and inhumane end. Many of the species which are being subjugated are rapidly dwindling in number and the unfathomable pain and torment which is involved is unworthy in a nation that thinks of itself as enlightened and advanced. Although we must realistically admit that animals will necessarily be employed in some medical research, our actual viewing of some of the tortures which are inflicted upon innocent and defenseless creatures (notably by the U.S. Army) has left abhorrent and repugnant scenes in our memories that have coalesced into gnawing, terrifying nightmares.

We believe that a justified first step out of this moral abyss is passage of H.R. 556 and the foundation of a national center for alternative research. Alternative methods are largely available at present --- establishing such a center would speed the development of others and promote the use of more humane yet equally effective methodologies.

Please work for passage of H.R. 556 and work to halt the grotesque and inexcusable travesty which we are imposing upon our fellow inhabitants of this Earth.

Respectfully,

Brent & Roberta Geary

Brent & Roberta Geary

4500 Brentwood Stair #2031
Fort Worth, Texas 76103
October 7, 1981

Congressman Doug Walgren, Chairman
Subcommittee on Science, Research and Technology
U. S. House of Representatives
Washington, D. C. 20515

Dear Representative Walgren:

I am writing to express my support of H. R. 556, Congressman Roe's proposal to establish a national center of alternative research - an excellent solution to the problem of the use of live animals for medical research and testing.

This proposed measure is in the spirit of the $1 million grant made recently by the Cosmetics, Toiletry and Fragrance Association to Johns Hopkins University's School of Hygiene and Public Health. This grant is to fund research for development of substitutes for animal testing, the results of which will be made available to all.

Your inclusion of this letter in the official hearing record would be very much appreciated.

Thank you.

Respectfully yours,

Christine Burton

(Mrs.) Christine Burton

/cb

cc: Representative Jim Wright
U. S. House of Representatives

October 13, 1981

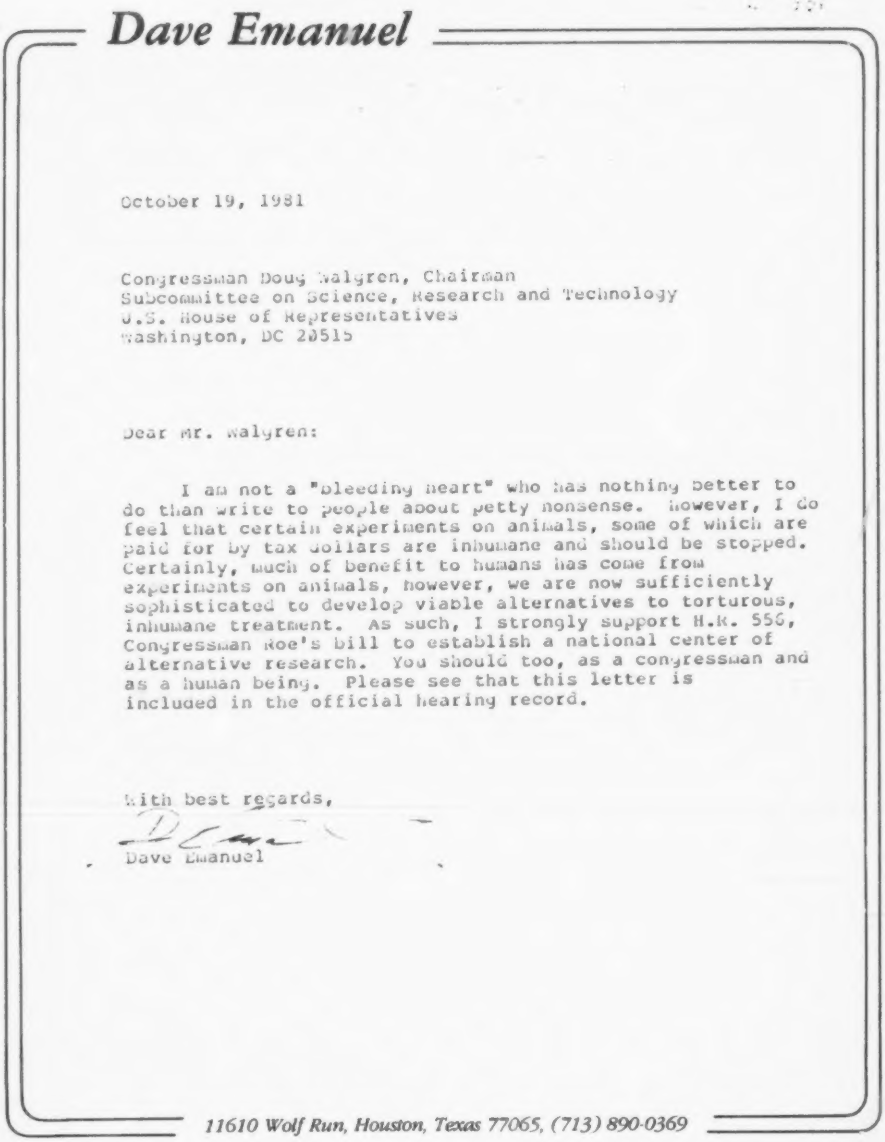
Distinguished Congressmen:

As a physician actively involved in patient care, I wish to state my strong support for H.R. 556, The Research Modernization Act. For too long, we taxpayers have funded useless, wasteful and cruel animal experimentation, often using antiquated methods. We support a self-perpetuating research industry which regulates itself and decides what is worthwhile and what isn't. Unfortunately, the judgement of those involved is often extraordinarily poor. I know from first-hand observation how little of this costly animal research is truly valuable and how much is degrading to our society. Little consideration is given to using valid alternative methods.

Our funds for research are limited. Let us use them wisely to benefit mankind and not to cater to the egotistical needs of those determined to get a paper published at all costs. Let us ensure that necessary research uses up-to-date, humane techniques.

By re-directing federal funding to promote modern research methods and by eliminating wasteful duplication, The Research Modernization Act is a critical part of this process.

Sincerely,
Daniel H. Silver, M.D.
Los Angeles, Calif.



Dave Emanuel

October 19, 1981

Congressman Doug Walgren, Chairman
Subcommittee on Science, Research and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Walgren:

I am not a "bleeding heart" who has nothing better to do than write to people about petty nonsense. However, I do feel that certain experiments on animals, some of which are paid for by tax dollars are inhumane and should be stopped. Certainly, much of benefit to humans has come from experiments on animals, however, we are now sufficiently sophisticated to develop viable alternatives to torturous, inhumane treatment. As such, I strongly support H.R. 556, Congressman Roe's bill to establish a national center of alternative research. You should too, as a congressman and as a human being. Please see that this letter is included in the official hearing record.

With best regards,

Dave Emanuel

11610 Wolf Run, Houston, Texas 77065, (713) 890-0369

October 6, 1981

Congressman Doug Walgren, Chairman
Subcommittee on Science, Research & Technology
Rayburn Building, Rm 2319
Washington, DC 20515

Re: Hearing on Use of Animals in Biomedical Research

Dear Congressman:

I would like the following information introduced for the record. As a person with more than 20 year's experience in medical research, I am against the enactment of H.R. 220, 2110, 556, 930 and 4406. The overt sentiment of these bills, namely to promote humane treatment of animals as research subjects and to promote the utilization of research alternatives to animals, is misguided. The very existence of the bills suggests that researchers take some fiendish delight in subjecting animals to surgical procedures and even needless pain. In point of fact, animals are treated by most scientists as sentient creatures worthy of high respect. Scientists who disregard the feelings of their research subjects are publically castigated and humiliated in the forum of their peers.

It is fine to recommend the use of tissue cultures or computer simulation techniques as alternatives to animal research, but in reality this is usually not practical. In my own research I try to learn about the function of the kidney in order to improve the treatment of kidney diseases by transplantation. The research requires involved studies of fluid flow through the kidney. Certainly tissue cultures of kidney cells are not ameniable to these studies. And if we knew enough to do computer simulations, we certainly would. But we are forced to buy relatively expensive rabbits and willingly use go through a prolonged anesthetic process in order to get the information we need to help human patients.

Someday, when we have a lot more information from rabbit and dog experiments, computer simulations may be possible, but to enact legislation to mandate simulation research is much like mandating an automobile be built (to spare our horses) before the wheel is invented.

Thank you for your interest in these thoughts.

Yours very truly,

Armand M. Karow, Ph.D.
Professor of Pharmacology
Medical College of Georgia
404-828-3501

SEP [illegible]

Canine Corner
John Kammeyer
3712 Sechrest Ave.
Bakersfield, Calif. 93309

Congressmen Doug Walgren
Chairmen, Subcommitee on Science,
Research and Tecnology
U.S. House of Represenatives
Washigton D.C. 20515

Hon. Doug Walgren:

Concering the up-coming hearings scheduled for October 13 and 14 on the use of animals being used for research. It is my hope that this letter be placed in the offical hearing records.

I write a column for the Bakersfield Californian, called "Canine Corner". Many of my readers are aganist the use of any animal being used for medical reseach. My own view is that I do not feel that medical,research can be done without some use of animals, however I do feel that these experiments/Do NoT need to be cruel. I feel they should be done in a humane manner, and housed in a humane manner. Some reports I have read about some of the research that has been done, is real dumb as well as cruel.

I do feel that H.R. 556. Congressmen Roe's bill should be passed. This would be a start in the right direction.

Thank You

John Kammeyer

October 2, 1981

Congressman Doug Walgren,
Chairman, Subcommittee on Science,
Research and Technology
U. S. House of Representatives
Washington, D.C. 20515

Re: ANIMAL EXPERIMENTATION HEARINGS

Dear Congressman Walgren:

I am writing to express my strong opposition to the use of animals for medical, technological and scientific research. Each year, over one million animals are subjected to torturous experimentation that is repeated time and time again, thus causing even more animals to be in pain, and to suffer. These experiments are carried out in the name of science, but why should any type of living creature suffer for the betterment of another? U.S. taxpayers, unknowingly, pay for many of these research projects. There is a great need to develop alternative methods of research other than the use of animals. The suffering these animals are submitted to is inhumane and unnecessary. I strongly support the need to develop alternative means of research techniques that exclude the use of animals. I support with great hope and optimism Congressman Roe's bill, H.R. 556, which would establish a regional center of alternative research. I am not opposed to medical research; medical research has helped many thousands of people, and may some day help myself or someone in my family, however I am against the use of helpless living creatures when another way could be developed.

I would like my letter to be included in the official hearing record, and urge your support in releasing animals from these torturous experimentations.

I would appreciate a response from you regarding your position on this matter, and the outcome of the hearings to be held on October 13 and 14.

Thank you,

Mimi Swain

Mimi Swain
600 W. 3rd St., #A214
Santa Ana, California 92701

cc: Congressman Jerry Patterson
34 Civic Center Plaza, Ste. 921
Santa Ana, California 92701

339 Grafton Avenue, Apt. 3K
Newark, NJ 07104
September 16, 1981

The Honorable Doug Walgren
Chairperson, Subcommittee on Science,
Research and Technology
House Office Building
Washington, DC 20515

Dear Mr. Walgren:

I am writing to ask that you please support, co-sponsor, and work for early hearings on H.R. 556, a bill to establish a National Center of Alternative Research.

Between 60 and 100 million animals die each year after undergoing extreme pain and suffering in American research laboratories. Their sufferings include starving, poisoning, blinding, burning, freezing, beating, and mutilation while interest groups such as the Food and Drug Administration, cosmetics industry, and defense industry record the reactions of the animals. While I recognize the necessity of testing new products for human health and safety risks, I also recognize that there are many effective alternative methods of testing, methods which do not involve such cruel and insensitive experimentation on living creatures.

The National Center for Alternative Research would see that all agencies which sponsor research would promote the use of existing alternatives and the development of more alternatives. Furthermore, it would help disseminate information on these other methods. These are noble and humane goals which must be supported.

Not only are alternative methods possible, but they are actual. They are simply not resorted to in enough instances. For ten years a London-based organization has been developing alternatives to animal experimentation which have been valuable in immunology, virology, toxicology, cancerology, endocrinology, pharmacology, and various other fields. This organization, called FRAME (Fund for the Replacement of Animals in Medical Experiments), publishes a journal outlining its alternative techniques. The journal is accessible to all who may need it.

Scientists in Berkeley, California have developed a bacterial test system to screen for potential carcinogens. In less than one week and at a cost of only $330, one chemical can be tested for cancer-causing properties. The test would cost $132,000 and take two years to complete if an animal system were used.

In experiments involving tissue, cell, and organ cultures, human sources may provide the material from biopsies, surgical operations, and autopsies. The material can then be cultivated in prepared nutrients. Furthermore, computers can define and analyze data from this material much more quickly than scientists can analyze data from animal experimentation.

Some of those who oppose H.R. 556 may cite that animals do not feel pain and suffering in the same way that humans do. This view is not borne out by the facts. Tests on the nervous systems of animals undergoing some form of stress show clearly that the animals are in fact in pain. While we, of course, cannot know precisely the quality of that pain, there is no doubt that there is pain, often very severe.

One of the great crimes of the animal experimentation community is its insistence on the duplication of the experiments of other scientists. It is absolutely unnecessary to torture a whole different set of animals just to see whether they feel the same pain that the first group experienced. Would not the money wasted on duplication be better put to use on research into alternatives?

Another problem with animal experimentation is that one cannot always accurately extrapolate data from animals to humans. An animal may be far more sensitive to a particular drug than a human may be, and vice versa. So conclusions may not always be regarded as accurate or pertinent.

It is absolutely essential that cruelty in all forms be minimized. How can we continue to allow such widespread and blatant cruelty to be practiced? In the name of humaneness I again ask you to please support, co-sponsor, and work for early hearings on H.R. 556.

Thank you.

Sincerely,

Susan Lenczyk

29 September 1981

Doug Walgren, Chairman
Subcommittee on Sciences,
Research and Technology
Rayburn Bldg, Room 2319
Washington, D.C. 20515

Dear Mr. Chairman,

As a graduate student in physiology, an employee in a veterinary office, and a pet owner, I feel a special need to convey to you my thoughts regarding the use of live animals in research.

Accurate knowledge of physiologic mechanisms is the foundation for treatment and prevention of disease and has provided the basis for medical training for many years. Much of this information has been gained from experimentation on diverse animal species and extrapolated to the human conditon. Although many aspects of these mechanisms are physical or chemical in nature and can be studied with cultures, in vitro assays, and mechanical models, the overall picture and understanding must be acquired from scientific analysis of the entire living organism. We are all keenly aware of the miracle of the living body and its complexities. To attempt to draw inferences from an isolated facet to comprehend the whole being would be most inaccurate and foolish. Scientists must be provided the means to duplicate, as nearly as possible, the human condition in whatever disease process is being studied. Animal models provide this integral, essential function.

The "growing public concern over the suffering of large numbers of animals used in research and testing" may in some instances be justified and where justification exists, the concern does not exclude the members of the scientific community. As a certified veterinary technician and an animal lover, I have never condoned mistreatment, pain, or suffering on the part of laboratory animals. I would be in the forefront of those condemning poor husbandry, haphazard techniques, and thoughtless, wasteful experimentation. I insist upon and expect conscientious, well-planned protocols from my own research and the research of those persons I work with. I encourage in vitro studies wherever possible, and attempt in my sphere of influence to promote awareness by my colleagues of the criminality of improper animal treatment and the necessities of controlled, competent experimentation.

As many of us have learned, great errors can be made in drawing conclusions from a single course of data. Duplication of experiments is an essential aspect of the scientific method. This does not mean of experiments be designed to include proper controls, proper chniques so that the experiment provides accurate, useful data and can be replicated by others. Good statistical analysis, proper design of protocol, and even cautious, conscientious awarding of grants by advisory committees are crucial. Existing procedures in the route from experimental planning to implementation and reporting should be examined and modifications made to insure not only the biological relevance but the quality of data collection. To "eliminate or minimize duplication of research and testing on live animals" is not a proper approach and may prevent a thorough scientific search for answers to medical problems.

I am very much in favor of the subcommittee's examination of possible excessive, "unnecessary, uneconomic or inappropriate" use of animals. I can condone nothing but humane and appropriate use and feel as humans we are morally obligated to protect other species from torture and cruelty. Experimentation, under proper guidance and veterinary supervision, is neither torture nor cruelty but a necessary means of searching for the answers to human and animal suffering and disease.

I thank you for your investigation into the shortcomings of the uses of animals in research. I hope that possible loopholes and loose ends can be defined and corrected so that the public will continue to benefit from the knowledge gained by experimentation.

Sincerely,

Sharon E Martin

Sharon E. Martin
6101 Beech Avenue
Bethesda, MD 20817

Bruce K. Beyer
1105 15th St., Apt. A-4
Augusta, Ga. 30901

Rep. Doug Walgren, Chairman
Subcommittee on Science, Research & Technology
Rayburn Bldg., Room 2319
Washington, D.C. 20515

Oct. 6, 1981

Dear Rep. Walgren:

I have recently learned that your subcommittee will soon be holding hearings concerning the use of animals in scientific experiments. The purpose of this letter is to express my views regarding this subject. I should note at the outset that I am a graduate student in the Department of Pharmacology at the Medical College of Georgia (Augusta, Ga.) and, as such, have a vested interest in the outcome of any legislation in this area.

While I concede that in certain specific situations (such as predicting the mutagenicity of a compound), alternative methods to the use of live animals may prove cost- effective and correlated with results presently obtained, it is premature to expect that all animal experimentation can be conducted utilizing such alternative methods. Certainly, attempts in this direction should be encouraged, but I propose that sufficient negative evidence is at hand to preclude requiring the use of such alternative techniques. A case in point concerns my own area of interest, teratology (i.e., the study of birth defects). So little is known about the mechanism of teratogenesis that it is frequently impossible to predict how a given (untested) compound might affect a developing child. In fact, alterations produced in one species may not be apparent in another, such as the case (retrospectively) in examining the effects of thalidomide. It is therefore important to utilize a wide range of testing systemm and a variety of different animal species in teratological evaluations (also true for toxicological studies).

The roles of the mother, fetus and placenta must be elucidated before predictions could me made utilizing computer models in teratology, while all three are lacking in tests utilizing single- cell organisms (Ames test). In most areas of biomedical research, as well as in many biological systems, the interaction of various organ systems often determines the overall response. In this regard, one must correlate all in vitro results with the in vivo situation, thereby necessitating the *use of living animal models as test systems. Such is the case with regard to blood pressure regulation, where the nervous system, hormones, blood volume and disease states of the cardiovascular and renal systems all play a role.*

As long as the guidelines of the existing Animal Welfare Act are followed, animals will be subject to minimum discomfort during experimentation. The proposals of HR 4406 will further strengthen this Act and should be supported. (I should note that a suitable definition of "pain" or "suffering" will be difficult to derive. Most scientists would welcome guidance in this respect since brutality has no valid place in experimental research.) Additionaly, expansion of this Act to include all animals utilized for research (especially, rats and mice) further enhances the attractiveness of HR 4406.

In conclusion, I urge your subcommittee to support HR 4406 (provided a clear definition of "pain" and "suffering" can be formulated). On the other hand, I urge you to reject HR 930, HR 220 and 2110 and HR 556 since each presumes that acceptable alternative methods to the use of live animals currently exist. The search for such alternatives will proceed by the private sector (including scientists engaged in basic research) without further expenditure of public funds. In addition, numerous regulations for product testing (such as those by the FDA) currently require live animal experimentation and would have to be revised should alternative testing legislation be enacted.

Please feel free to introduce this letter (or its major points) into the subcommittee hearing record. I hope you can resolve this complex, but vitally important, issue which ultimately affects every citizen in this country. After all, I would not want to take a drug or eat food (with additives) which had only been subject to computer modelling prior to marketing.

Respectfully submitted,

Bruce K. Beyer

Bruce K. Beyer

Oct. 4, 1981

Dear Congressman Walgren,

I am writing to you in regard to the hearings which are scheduled for Oct. 13 & 14 on the use of animals in medical research and testing.

As one who is deeply concerned for the well-being of all living things, I am opposed to the painful experiments on animals, particularly those which are unnecessary and repetitious. In view of the fact that many of these experiments are funded by the U.S. taxpayer, I feel that I can safely speak for countless other taxpayers of the desire to see our tax dollars go instead, to the development of alternatives to the use of animals.

I strongly support Congressman Roe's bill (H.R.556) which would establish a national center of alternative research.

It is my understanding that many scientists are already in favor of finding alternative methods. I would like to believe that it is because they would like to feel responsible for a great advancement in medical research, and a discarding of what can now be considered antiquated barbarianism. I doubt that any respectable researcher fears for his job, but rather welcomes a chance to bring about changes toward a more decent world and many are beginning to regard much of the present methods as distasteful and horrible.

Please include my letter in the official hearing record.

Most Sincerely Yours,

Jane Carroll

Jane Carroll
P.O.Box 734
Conneaut, Ohio 44030-0734

October 4, 1981

Congressman Doug Walgren, Chairman,
Subcommittee on Science, Research and Technology,
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Walgren,

Medical researchers deserve much praise for the benefits they have given to man in the form of vaccines and various drugs to combat illness. My concern though is with the harm and abuse animals receive in associated laboratory experiments. An animal is a living being very much able to feel pain. Should we Americans, living in such a sophisticated society, permit the torture of animals in the name of science? Alternative forms of research must be found which are more humane.

I definitely support Congressman Roe's bill (H.R. 556) which would establish a national center of alternative research. I would much prefer my tax dollars funding this type of research rather than the inhumane painful experiments currently conducted on animals.

Please include this letter in the official hearing record when hearings are held on the use of animals in medical research and testing.

Sincerely,

David E. Stolzenfeld
7260 Warwick
Detroit, Mi. 48228

Sue Lunson Farinato
78 Brookings Street
Medford, Massachusetts 02155

October 2, 1981

Honorable Doug Walgren
Chairman, House Subcommittee on
Science, Research and Technology
117 Cannon House Office Building
Washington, D.C. 20515

Dear Mr. Walgren:

I am writing to you in connection with the hearings which the Subcommittee on Science, Research and Technology will be holding on October 13 and 14 regarding the use of live animals in medical research and laboratory testing.

I have worked with animals in many capacities; as a veterinary assistant, zookeeper, humane worker, and in research. In 1975, I worked as an animal technician at Harvard Medical School in their Animal Research Center. I would like to tell you a little bit about my experience there.

In the course of the six months I worked in the Center, I witnessed animals suffocating because of overcrowding, filthy "living" quarters because of poor supervision, dogs being sold out of the research kennels (those which were purebred or good-looking specimens) to private parties, dogs being transported (in the summer) in unventilated, cramped and filthy trucks, overheated animal rooms with no cooling systems, and cruel methods of euthanasia. The veterinarians in the Center were aware of many of these problems but did not appear to be concerned about them. The full-time veterinarian was incompetent and didn't want to be bothered, so he was rarely consulted. Complaints about over-heated rooms and uncleaned cages to my supervisor were ignored. The whole building was ridden with roaches which ran from room to room, floor to floor, and from contaminated colonies of animals (monkeys with herpes, guinea pigs with strep) to uncontaminated colonies. How valid can "research" be under these conditions?

I did not witness much interaction between investigators and their animals. I did, however, take care of some animals who were definitely in pain or under stress (rabbits with infected swollen feet, cats going blind). I cannot comment on the validity of the experiments themselves; but I DO question the validity of the results of experiments carried out under these circumstances. It is one thing that animals must endure pain, discomfort and stress for the sake of research when carried out properly; it is quite another when they are subjected to abusive treatment under the name of "research" - that is sheer waste of animal life.

I contacted the USDA and the Massachusetts SPCA about the conditions at the Animal Research Center. The told me they planned to do a joint inspection of the facility. I quit soon after this, and do not know if an inspection did take place or if anything was done to correct these conditions. I do know, however, that the Center always seemed to know when the USDA inspectors were coming.

Though I have worked with animals in a wide variety of ways, I have never seen them so thoroughly exploited as they were here. I did what I could to try to remedy the living conditions of the animals in the Center. Now, I urge you to do anything you can to stop some of the needless suffering of animals in laboratories around the country. There is no justification for mistreatment of animals - not even research.

Thank you very much for your time and attention.

Very sincerely,
Sue L. Farinato
Sue Lunson Farinato

10511 Mahoney Drive
Sunland, California 91040
October 15,1981

Honorable Doug Walgren, Chairman
Subcommittee on Science, Research, & Technology
House Office Building,
Washington, D.C. 20515

Re: HR556 "For the Record of the Hearing"

Dear Sir:

Emotionalism runs high on both sides of the animal research issue. One side maintains that live animal experimentation is a vital part of research and the other argues that extreme pain and inhumane researchers and methods mandate alternatives. Ultimately, of course, no one would argue for a cessation of medical experimentation or that such experimentation does not benefit animals as well as humans.

Because research funds are always at a premium and because experimental resources (drugs and live animals) need to be conserved and valued, it is our opinion, therefore, that alternative methods such as those included in HR556 must be investigated. For example, if sea urchin eggs will yield the same test results as live animals, then by all means let's use sea urchin eggs. If experiments are merely duplications of past successes or failures, then certainly films or pictures for educational purposes must suffice.

If a certain number of experiments mandated by law for specific drugs have no effect on certain species of animals, ie. aspirin's effect on rats has no relationship to that in humans, then let us not subject these animals to such unwarranted examinations. (Note, for example, the published test results of Thalidomide or Saccharin and their eventual impact, or confusion as the case may be, as they related to the human species).

HR556 has been a long time in coming. In today's complex world the cause of medical research is too important to be thrown away on unnecessary procedures and fruitless investigations. HR556 must become law.

Sincerely,

Andrea and Jim Fitman

NATIONAL COALITION FOR

ALTERNATIVES TO ANIMAL EXPERIMENTATION

September 27, 1981

Dear Representative Walgren,

I understand that hearings for H.R. 556, The Research Modernization Act, have been scheduled for October and that you are now accepting written statements for the record. I submit this letter for insertion into the hearing record. Twenty copies are enclosed. A petition for H.R. 556 is also enclosed.

Twenty years ago, perhaps even ten years ago, a bill of this nature would have been an impossibility. Development in non-animal testing alternatives just weren't available. The common philosophy was that animals are sacrificed so mankind can live a fuller, healthier, and longer life. The fact that many experiments served no purpose to mankind and caused needless suffering to animals was clouded in the interest of pure science and shadowed by the issue of human survival. A handful of "anti-vivisectionists" protested as they had since the beginning of the century but the masses considered these people "crack-pots".

Times have changed. Technology has changed. The American public has changed. The animal rights movement no longer involves a handful of people. Concerned citizens number in the millions. As more and more publicity is presented to the general public via newspapers and magazine articles, discussions on national news programs and talk shows, the issues have moved out of the realm of just a handful of "animal lovers" to people who are not necessarily animal lovers but who question the morality of some experiments and the waste of their tax dollars. Questions have arisen in the American mind as to the need of many experiments, especially when animals suffer for no ultimate purpose. Citizens wonder why pursuits into alternatives are not being attempted on a wide scale basis. And further why in the world so much of our money is being wasted on outdated procedures.

H.R. 556 confronts these questions. It treats an issue of prime ethical importance for our evolving society. The time for investigation into alternatives to animal experimentation has come, as many scientists agree. Alternatives are more economical, reliable and efficient. And in the long run, the question of morality regarding suffering animals will be answered. The pain and suffering will be alleviated and in many cases terminated altogether in several testing situations. There seems no logical reason for H.R. 556 not to be enacted.

Sincerely,

Jacquie Leonhardt

Ms. Jacquie Lewis Leonhardt
District Coordinator
3657 South Wolcott
Chicago, Illinois 60609

Enclosures

8 Mullane Avenue
Holbrook, MA 02343
September 25, 1981

Representative Doug Walgren
Chairman, Subcommittee on Science,
Research and Technology
Suite 2321 Rayburn House Office Building
Washington, DC 20515

Re: Alternative Methods of Research
H.R. 556; H.R. 220; H.R. 2110; H.R. 930

Dear Representative Walgren:

Thank you for your encouraging response to my letter of September 8, 1981, in which I urged the Committee on Science and Technology to schedule hearings on H.R. 556, the Research Modernization Act, at the earliest possible date. I am most gratified to learn that the Subcommittee on Science, Research and Technology has marked this and other similar bills dealing with the establishment of alternative methods of laboratory experimentation not involving animals for hearings on October 13 and 14.

At this time, I would once again like to express my strong support for the passage of H.R. 556 and its companion legislation, H.R. 220, H.R. 2110, and H.R. 930. I am very hopeful that your Committee will take positive measures to effectuate the passage of these pieces of important humane legislation. I have corresponded extensively on the subject of alternatives to animal experimentation with my Congressman, Brian Donnelly, who has been exceedingly receptive and responsive to my correspondence. Representative Donnelly sponsored H.R. 2110; and his selfless and dedicated work in the area of humane and wildlife legislation is, indeed, inspiring to me.

In furtherance of my hopes for the passage of H.R. 556 and its companion legislation, I would request that you include this letter as part of the official hearing record when your Committee meets on these matters in October. I feel that legislation such as that which you will be considering on October 13 and 14 is deeply relevant. The passage of these important bills will mean a future where technological advancement will be coupled with moral and humane considerations; the failure of these bills to be passed will mean a future of technology devoid of compassion and concern for the other, weaker species co-existing on this Earth with the human race.

In closing this letter, a statement made by Mahatma Gandhi comes to mind. Gandhi once said that the manner in which a society treats its animals is a measure of that society's moral stature. I would like to hope that our society can see beyond its wreckless drive for technological achievement and consider the effects our technological greed has, not only in the sense of the past suffering and pain endured by the animal victims of laboratory experimentation, but in the sense of the needless future suffering of these creatures that can, through your legislative efforts, be prevented.

Thank you for your support of these bills.

Sincerely,

Sandra M. Meggison

Sandra M. Meggison

Congressman Dannemayer

This is an excellant opportunity to make my views known to you. I ask that this letter be included in the official hearing record.

Although animals contributed greatly to the treatment of malaria, human blood desease, yellow fever, polio and liver disease.

How about the Swine Flew Shot, Saccrin, Dibetis, these drugs and cures were proven on animals, but yet they don't work for man, the Swine Flew Shot even diseased some people which there is no cure for. Animal testing is not accurate enough for human disease, they are not like us in this respect.

If it is true that every drug precribed for humans is first tested on animals, presumably to insure

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its safety, why have so many "modern" drugs proved harmful, if not actually fatal, to humans? Why did 60,000 people in the U.S. die from medicaments they were prescribed in 1974? Why did Thalidomide deform more than 10,000 babies? Why is Stilboestrol causing vaginal cancer in young women whose mothers were prescribed the drug? Why did the swine-flu vaccine (1976) kill or paralize so many that were innoculated? Why did Tuberkulin cause Tuberculosis instead of cure it?

Taxpayer's pay over 4 billion dollars a year for these inefficient experiments. They also pay for the duplication of many experiments and the obvously unnecessary experiments.

We must use alternitives, the use of tissue, cell, and organ cultures as alternatives could save the lives of thousands of animals each year. They are practical and economical alternatives which can easily replace many of the animal experiments currently in use.

The advantages of cell, tissue, and organ culture are many:

A) An unlimited amount of both normal and diseased material is available.

B) The cultures can be frozen for long periods of time.

C) The incubation period for infections in cultures is six to eight times as short as that in animals. In carcinogen identification, results can be obtained in 10 to 21 days as compared to months or years for animal tests.

D) The problem of species variation is avoided.

e) Test substances can be rapidly eliminated from the cultures, or new cultures can be used, if it is necessary to repeat the experiment. Elimination time is very lengthy in animals.

f). Culture experuments are much cheaper than animal experiments, and only minute quantities of test substances need be used.

Micro-organisms, invertebates, and eggs can be used to screen drugs, to identify carcinogens, to evaluate anesthetics, and to study nutrition.

Micro-organisms such as bacteria and protozoa can be used as models of basic life processes. They can be used in nutritional research to determine vitamin concentrations. In drug testing, a number of new techniques using microorganisms have been developed: salmonella bacteria are used in the Ames Test to screen substances for carcinogenicity and mutagenically (the ability to produce changes in cells which are transferred to the offspring of cells), a new test called prophage-induction test uses bacteria to detect carcinogenity, and substances which cause birth defects can now be identified using single-celled organisms.

Invertebrates - can be used in tests for toxicity.

Eggs - can be used to study whether a substance is toxic in a fetus. The normal method of this type of testing is to administer the substance to a pregnant animal and then check her offspring for adverse effects. By using eggs, researchers can determine problems in an unborn fetus.

Computers - are not presently being used to their fullest potential in research experiments. Complete and efficient use of m computers could prevent the suffering of thousands of animals by streamlining the experimental process: computers can refine the experiments by making the best use of data obtained and they can reduce the number of animals used by designing and planning better experiments. Computers can be programmed to: Carry out detailed calculations on data obtained from experiments.

Carry out experimental procedures automatically

Analyze existing experimental data and say wheather or not a proposed experiment is worth doing.

Test out combinations of experimental conditions.

Demonstrate physiological principles such as the action of the heart beating.

Deal with problems like the fate of drugs taken into the body, the concentration of drugs in different body compartments, and the rate of metabolism and excretion of drugs, based on given tissue data.

Predict properties of new drugs and suggest properties of drug design.

Test out theoretical ideas about the interplay of nervous impulses.

Serve as a model simulating the living animal (heart & circulation, kidney and body fluids, and lungs and blood gas exchange). Using mathematical models, scientists can draw accurate conclusions about intricate responce patterns.

Experiments are performed to obtain new data. Computers can never create data; they can only perform calculations based on information given to them. Computers could replace animals in routine experiments dealing with known variables, though, and as man's knowledge of the body increases and is stored in the computer's memory, computers will be able to perform more and more of such experiments.

Audio-Visual Aids can replace many of the animals used in school discussions and lectures. Closed-circuit television, for example, can replace demonstrations on live animals. Only one animal would be used for the initial filming, rather than one for each lecture. The use of zoom lenses would enable students to see areas of the body which, in a normal classroom lecture, would have been impossible to see. Dummies could be used in schools as an alternative to dissection for teaching the structure of the body. The University of Alberta Medical School, for example, uses "computer patients" which are programmed to recover, linger, or die, depending upon which buttons the student presses.

I can't urge you enough to develop alternatives to the use of animals. I fully support H.R. 556, Congressman Roe's bill which would establish a national center of alternative research.

Please support H.R. 556
Ms. Rita Name
& Steven J. Monahan

Congressman Doug Walgren
Chairman, Subcommittee on Science,Research & Technology
US House of Representatives
Washington, D.C. 20515

November 28, 1981

Ms. Laurel Delia Schurk
506 N. Rocky River Dr.
Berea,Ohio 44017

Dear Congressman Walgren,

Firstly, I am requesting that this letter be included in the official hearing record regarding H.R. 556.

According to the 1977 figures from the Institute for Laboratory Animal Resources, over 64 million warm-blooded vertebrates were used in the United States. Many of these tests are repetetive, inconclusive, not always applicable for human comparison, and many times performed simply to justify the existence of various laboratories and consequential employment of countless people.

Many of these tests are extemely painful and cause prolonged suffering. It is bad enough that so much suffering must be inflicted for the testing of drugs and medicinal purposes; but that it must be indured for the sake of vanity and fashion is really abhorrent .

The F.D.A. regulations do not specify that ingredients must be tested on live animals, but only that they "shall be adequately substantiated for safety". Also, according to a recent letter from the H.E.W. Dept.; the F.D.A. states that the Federal Food Drug and Cosmetic Act does not require safety testing of cosmetics or their ingredients.....the Act does not give the F.D.A. the authority to specify the types of tests that should be performed......their are no specific cosmetic regulations that require that animal testing; including the Draize Test (eye or patch) be conducted prior to marketing.

Regarding alternatives available where testing is deemed in the best interest to the consumer; the research being done by firstly,Dr. Graham Richards (Physical Chemistry Laboratory,Oxford University); secondly Dr. Jan Knapowski (Inst. of Physiological Science, Poznan, Poland), and thirdly Dr. C.E. Gordon-Smith (Dir. of Pathology at the Microbiological Establishment, Porton, U.K.), can be reguarded as proof of the positive possibilities of humane testing alternatives.

In light of the above information I would like to stress my urgent support of H.R. 556, congressman Roe's bill,which would establish a national center for alternative research.

Thanking you in advance for your time,
Ms. L.Delia Schurk
506 N. Rocky River Dr.
Berea, Ohio 44017

Copy sent to Congressman Ronald Mottl

Elizabeth M. Lee
Lloyd Lane, Lloyd Neck
Huntington, New York 11743

10/18/81

Congressman Doug Walgren
U. S. House of Representatives
Washington, D. C. 20515

Dear Mr. Walgren:

I am strongly in support of Congressman Roe's bill (H.R. 556) which would establish a national center of alternative research as opposed to the present animal experiment methods. To have my money actually used in what is frequently painful and often unnecessarily repetitive experiments on animals is unforgiveably cruel. As Chairman of the Subcommittee of Science, Research and Technology, I expect your authority and weight is of primary importance. Please, help the animals!

It really shouldn't be necessary to beg for compassionate treatment for all the animals who share this earth with us and who bring us such loyalty and happiness. The wild creatures are both beautiful and of inestimable importance in nature's plan.

I would appreciate your including this letter in the official hearing record. Thank you for your efforts.

Cordially,
Elizabeth Lee
Elizabeth Lee

Kathleen J. Waddell, Ph.D. • Clinical Psychologist
Texas License & Certification # 2-1800-8
California License # PL 5636

Nov. 14, 1981

Congressman Doug Walgren
Chair, Subcommittee on Science,Research & Tech.
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Walgren:

I am writing to you in support of H.R. 556, Congressman Roe's bill to establish a national center for alternatives to animal experimentation and research. Speaking from first hand knowledge of the painful and often very cruel experimentation conducted on animals, I have noted that the result most often seen is the development of insensitivity by the experiment rs and a cavalier and unresponsive attitude toward the suffering of these innocent victims. I think that this model of scientific experimentation is harmful to animal and scientist alike.. It is an archaic method which results in the destruction of animal life and human emotion.

Please enter my letter as evidence in the official hearing record. Contact me if I can be of further assistance.

Sincerely yours,

Kathleen J. Waddell, Ph.D

copy to Honerable Jake Pickle
House of Representatives

504 East 42nd Street, Austin, Texas 78751
512-452-4106

NOV 12 1981

[illegible] Aberdeen Dr.
Lakewood, NJ 08701
Nov.9,1981

Dear Rep.Walgren:

Thank you for holding hearings on H.R. 556, the Research Modernization Act.

First, I must say that I am not a member of any organization . I am writing thisletter because I feel strongly about experimentation on animals. I am very emphatically against experimentation on animals. It is cruel, it is barbarous, it is stupid.

Second, I am very interested in human health. I read PREVENTION, Let' Live, and Medical Self Care magazines every month or quarter, as the case may be.I have been reading PREVENTION for over 15 years. I have been reading books on various aspects of nutrition, vitamin supplementation, herbal healing, vegetarianism for well over 20 years- and I have been particularly interested in the healing qualities of particula foods and herbs and in the avoidance of artific chemicals, preservatives and over processing of foodstuffs.I tell you this so that you understand the argument against animal experimentation is a realistic, rational and practical argument and not wishful thinking.

In my view, knowledge about health and disease is best obtained by studies of different populations.For example, Dennis Burkett made his enormously important observations about the health-inducing properties of fiber and its usefulness in modern diets as a specific against cancer and various forms of stomach problems after comparing African and western diets. Weston Price,a dentist in the thirties, compared the diets of different peoples.on teeth and highlighted the importance of raw, natural diets on dental health. Observations on the Hunza people's diet in Pakistan and the Villecamb people in South America supported the view that a natural diet plus daily exercise is, over the generality of a poplulation, a recipe for health.

Further, work by Drs. Shute, Pauling, Irwin Stone, and many others shows the importance of mega-vitamin supplementation in preserving health or restoring it. All of this work and that of the men mentioned in the previous paragraphs was done without animal experimentation. Such work has shown- along with work by Drs. Mandrell and others on allergies- that it is possible to cure deepseated health problems without animal experimentation. I implore you, if you haven't read such literature, to do so in depth, because it would be tragic to torture animals -and kill animals- in the name of human health, when it isn't necessary.

Animal experimentation is used by those who are intoxicated by the idea of drugs in the treatment of disease. I have tried to show that, in this brief letter, there are really and truly effective alternatives todrugs, alternatives that do not produce bad side effects.

Please-please-please help the animals by saving them from torture, from injury, from death. I do not believe in God so I will not say they are God's creatures, but, surely they deserve our love, our awe, our admiration. We can fight disease and preserve good health without hurting them.

Sincerely

Alfred R. Winter
Clare M. Winter

123 Reed Creek Road
Martinez, Georgia 30912
October 6, 1981

Congressman Douglas Walgren
Chairman
Subcommittee on Science, Research
and Technology
Rayborn Building, Room 2319
Washington, D.C. 20515

Dear Congressman Walgren:

I am writing for the record in regard to serveral bills to be considered in the House of Representatives. These bills are H.R. 930, H.R. 220, H.R. 2110 and H.R. 556 which are scheduled to be considered during hearings of your subcommittee beginning on or about October 13th, 1981.

These bills concern the use of animals in research and, while I support those aspects concerning the use of alternative methods for testing of cosmetic items as required by the FDA, the far-reaching consequences of such bills will be to damage our Nations leadership in biomedical research.

As an ophthalmologist and research scientist for the past 8 years I have had experience with animal research. Our own institution, the Medical College of Georgia, is accredited by the AAALAC which is recognized by the National Institutes of Health as the body which certifies research facilities. For my specific research efforts, in corneal disease there is no substitute for animal research. To penalize all researchers for the abuses of a few would be most shortsighted.

These comments apply to all bills referred to above namely H.R. 930, H.R. 220, H.R. 2110 and H.R. 556. It is imperative that the search for alternative methods for the Draize test as used by the cosmetic industry (because of the FDA requirements) does not impact on all biomedical science research.

Passage of H.R. 4406 is long overdue and should be approved.

I trust that these comments will be of value in consideration of these bills.

Yours sincerely,

David S. Hull

David S. Hull, M.D.
Associate Professor

DSH/es

Penna A. Miller
2264 Robinwood Avenue
Toledo, Ohio 43620

November 3, 1981

Chairman Doug Walgren
House Office Bldg.
Washington, D.C.

Dear Chairman Walgren:

Kudos to you for setting up public hearings on the 7 bills relating to the treatment of laboratory animals. Even though I learned of the October 13 and 14 hearings belatedly, it is heart-warming to know that some people in "high places" still care for the down-trodden.

I am devoting most of my retirement time as volunteer head of United Humanitarians Low-Cost Spay/Neuter Program, Toledo Branch. When animal life becomes more precious because of greatly reduced numbers of surplus animals, labs will be forced to seek alternatives to using live animals so freely and callously.

HR 4406 by Congresswoman Pat Schroeder which would amend the Animal Welfare Act so that controls would be in the hands of a committee including welfare organizations, the public at large, vets, medical doctors, etc. to serve as advisors to the Secretary of Agriculture in administration of the law, sounds like a sensible, humane bill. My suggestion is to make it "fool-proof" with real teeth in it.

Having beem involved in animal work all my adult life, I am appalled at the redundant experiments inflicting unnecessary pain on helpless creatures. The Federal Government needs to take a long look at the many grants it makes for animal experimentation. Some of the so-called research is so ridiculous to begin with! The poor primates especially, "get it in the neck" both figuratively, and realistically.

I am asking you to continue your good work by synthesizing the expression of the public will to reduce the numbers of laboratory animals, and especially, to curb the pain and distress inflicted on most of them. See enclosed.

P.S. The infamous Draize test
HAS TO GO!

Respectfully yours,

Mrs. Penna Miller

(Mrs.)Penna Miller

Enc.

Terri Bowman
Box 1761 HMC
Hershey, Pa. 17033
9-16-81

Dear Congressman Walgren,

I am writing to you concerning the upcoming hearing in October on the use of animals in research. I agree that excessive, unnecessary or inappropriate use of animals for research should be eliminated but this does not mean the elimination of animals used for research. Alternative methods should be encouraged where appropriate but even the cells and tissues for cultures originate from living animals and most cultures can only be maintained for a finite peroid of time before new tissues or cells must be obtained.

There are many situations where alternative methods can not be substituted for animal testing such as testing new vaccines or new drugs. I would not want to see new pharmaceuticals used in people without first being tested in animals. The living body is very complex with many metabolic, immunologic and adaptive pathways that are still a mystery. Therefore, at this point in time, it would be impossible to program a computer to simulate the complex reactions of the body to certain agents. Even testing these agents in animals requires many animals because of the variability of individual response seen in all living things.

The use of animal models for studying human and animal diseases is also very important. Several viral and bacterial agents can not be grown in cell or tissue culture so must be grown in animal models. One such disease is leprosy and then the only animal found to support the growth of the agent is the Armadillo. Many diseases involve multiple systems of the body. Studying isolated cells and tissues is helpful to a point, then one must study the disease in a living animal in order to understand the interrelationship of the different symptoms and pathologies of the disease, in order to develope treatments and hope to discover cures or how to prevent diseases, like diabetes and rheumatoid arthritis.

The use of animals in studying animal diseases is important in decreasing and eliminating zoonotic diseases, increasing food animal production, and decreasing animal suffering through research on better therapeutics and methods of disease prevention.

Another area where animal research is crucial concerns studying body reaction to biosynthetic implants such as pacemakers and joint prostheses. Also the surgical techniques for implanting such devices can be tried and perfected in animals before attempting the surgery on humans.

Live animals used for veterinary medical schools is very important and is an integral part of the veterinary student's training and education whether the student goes into private practice or research upon graduating. Concern for the patient is stressed at all times while the student learns diagnostic and preventive medicine techniques as well as surgical procedures. Anesthesia is always used with any surgical procedure and patient care, before, during and after surgery, is of utmost concern.

These are just a few situations where animal use in research is not only beneficial to mankind but also irreplaceable by other alternatives at this time. I feel that a harmonious and complementary balance between animal use and alternative methods can be acheived. I will be very interested in the results of this hearing. Would you please keep me informed of the subcommittee's findings. Thank you.

Sincerely,

Terri Bowman

Terri Bowman, DVM
Postdoctorate of Laboratory Animal Medicine

APPENDIX III

Bills Pending Before the Subcommittee

97th CONGRESS
1st Session

H. R. 556

To establish a National Center for Alternative Research; to develop and coordinate alternative methods of research and testing which do not involve the use of live animals; to develop training programs in the use of alternative methods of research and testing which do not involve the use of live animals; to eliminate or minimize the duplication of experiments on live animals; to disseminate information on such methods, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

January 5, 1981

Mr. Roe (for himself, Mr. Hollenbeck, and Mr. Richmond) introduced the following bill; which was referred jointly to the Committees on Energy and Commerce and Science and Technology

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A BILL

To establish a National Center for Alternative Research; to develop and coordinate alternative methods of research and testing which do not involve the use of live animals; to develop training programs in the use of alternative methods of research and testing which do not involve the use of live animals; to eliminate or minimize the duplication of experiments on live animals; to disseminate information on such methods, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Research Modernization Act".

CONGRESSSIONAL FINDINGS

SEC. 2. The Congress finds that—

(1) direct support for the development of alternative methods of research and testing is an appropriate and necessary role for the Federal Government;

(2) development of alternative methods of research and testing does not require additional expenditures of Federal funds;

(3) cooperation and coordination among agencies will result in more effective use of resources for research and testing;

(4) continued reliance on animal experimentation delays the development of new, more effective procedures;

(5) eliminating or minimizing the duplication of experiments on live animals will result in more productive use of Federal research funds; and

(6) there is a growing public concern over the suffering of large numbers of animals used in research and testing.

DECLARATION OF PURPOSE

SEC. 3. The purposes of this Act are—

(1) to establish a National Center for Alternative Research;

(2) to increase the use of existing alternatives to the use of live animals in research and testing;

(3) to encourage the development of more such alternatives;

(4) to provide for the training of scientists in the use of alternative methods of research and testing which do not involve the use of live animals;

(5) to eliminate or minimize duplication of research and testing on live animals; and

(6) to disseminate information on alternative methods of research and testing which do not involve the use of live animals.

CENTER FOR ALTERNATIVE RESEARCH

SEC. 4. The Secretary of Health and Human Services (hereinafter referred to as the "Secretary",) shall establish with the National Institutes of Health a National Center for Alternative Research (hereinafter referred to as the "Center").

(a) The Center shall be composed of representatives if each agency which conducts or sponsors research and testing involving the use of live animals, including but not limited to the Department of Health and Human Services, the Department of Defense, the Department of Agriculture, the

Department of Commerce, the Department of Energy, the Department of Transportation, the Environmental Protection Agency, the National Aeronautics and Space Administration, the Nuclear Regulatory Commission, the National Science Foundation, and the Veterans' Administration. The head of each agency shall appoint one employee of such agency to serve as a member of the Center. Such appointments shall be made on the basis of the training and experience of the employee.

(b) The Secretary shall appoint a Director who shall administer the Center under the supervision and direction of the Secretary.

(c) The Center shall ensure that each agency which conducts or sponsors research and testing involving the use of live animals shall use methods of research and testing which conform to this Act.

DISSEMINATION OF INFORMATION

SEC. 5. The Center shall disseminate information throughout the scientific community, in the Government, to the public, to private research institutions, to eductational institutions, and to the cooperating international scientific community, with respect to—

(1) alternative methods of research and testing, and

(2) opportunities for training in alternative methods of research and testing.

TRAINING

SEC. 6. (a) Each agency which conducts or sponsors research and testing involving the use of live animals shall make grants and enter into contracts with educational institutions to establish courses for the training of scientists in methods of research and testing which do not involve the use of live animals.

(b) Each agency referred to in section 4(a) shall make training programs available to scientists for the purpose of educating them in alternative methods of research and testing.

(c) The Center shall search the scientific data to identify duplication of research and testing.

ANNUAL REPORT

SEC. 7. (a) The Director shall submit an annual report to the Secretary which shall include—

(1) a summary of new developments in alternative methods of research and testing;

(2) an evaluation of the performance of the Center; and

(3) identification of alternative methods of testing which meet regulatory scientific needs of the agencies.

(b) The Secretary shall submit a summary of this report to the Congress.

APPROVAL FOR REGULATORY NEEDS

SEC. 8. (a) The Center shall identify and notify the Secretary of alternative methods of testing which meet the scientific needs of regulatory agencies and replace testing methods using animals.

(b) Nothwithstanding any provision of law to the contrary, within thirty calendar days following notification by the Center of the availability of such alternative methods of testing, the Secretary shall make and publish in the Federal Register a notice detailing the alternative methodology.

(c) No Federal funds may be used to initiate testing involving the use of live animals in cases in which a notice of available alternative method has been published in the Federal Register under section 8(b).

(d) The Secretary shall provide a reasonable opportunity for any interested person to file with the Secretary written comments regarding the notice under section 8(b).

ADVISORY COMMITTEE

SEC. 9. The Secretary shall establish within the Center an Advisory Committee to advise the Center. The Committee shall be composed of at least ten members. In selecting Committee members and in filling vacancies on the Committee, the Secretary shall consider recommendations from the research community, both public and private, and from the public. The Advisory Committee shall meet at least three times a year.

PROHIBITION ON USE OF FUNDS

SEC. 10. (a) No Federal funds may be used to conduct or sponsor testing involving the use of live animals in cases in which alternative methods of such testing have been published in the Federal Register under section 8(b) of this Act.

(b) No Federal funds may be used to sponsor or support research or testing involving the use of live animals if such research or testing duplicates work performed by any agency.

IMPLEMENTATION OF PROGRAMS

SEC. 11. (a) Each agency conducting or sponsoring research involving the use of live animals shall, in accordance with this Act, implement a program to develop and utilize alternative methods of research and testing that would eliminate or minimize reliance on the use of live animals in such research and testing.

(b) An agency may not conduct or sponsor research and testing which is not consistent with this Act.

FUNDING

SEC. 12. Effective in fiscal year 1982, each agency represented in the Center shall direct to the development of alternative methods of research and testing no less than 30 per centum and no more than 50 per centum of all appropriations made available to such agency for all research and testing programs conducted or sponsored by such agency involving the use of live animals.

NONDISCLOSURE OF INFORMATION

SEC. 13. The Secretary shall not disclose any information reported to or otherwise obtained by him in carrying out his duties under this Act which contains or relates to a trade secret or other matter referred to in section 1905 of title 18 of the United States Code.

DEFINITIONS

SEC. 14. For the purposes of this Act—

(a) "alternative methods of research and testing" includes, but is not limited to, the use of mathematical models, isolated organs, tissue and cell cultures, chemical assays, anthropomorphic dummies, simulated tissues and body fluids, mechanical models, computer simulations, or lower organisms; and

(b) "agency" shall have the meaning given such term in section 551(l) of title 5 of the United States Code but shall be limited to those that conduct or sponsor research or testing involving the use of live animals.

97TH CONGRESS
1ST SESSION

H. R. 4406

To amend the Animal Welfare Act to insure the humane treatment of laboratory animals.

IN THE HOUSE OF REPRESENTATIVES

AUGUST 4, 1981

Mrs. SCHROEDER introduced the following bill; which was referred jointly to the Committees on Agriculture, Energy and Commerce, and Science and Technology

---

A BILL

To amend the Animal Welfare Act to insure the humane treatment of laboratory animals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2(e) of the Animal Welfare Act (7 U.S.C. 2132(e)) is amended by striking out the colon and all that follows through "Act".

SEC. 2. Section 2(g) of the Animal Welfare Act (7 U.S.C. 2132(g)) is amended to read as follows:

"(g) The term 'animal' means any live or dead dog or cat, or any other live vertebrate creature, which is being used or is intended for use for research, testing, or teaching, or for the production of serums, vaccines, or other medical or veterinary products, or any live or dead warm-blooded animal used for exhibition purposes or as a pet; but such term excludes horses and farm animals not used by a research facility such as, but not limited to, livestock or poultry, used or intended for use as food or fiber, nutrition, breeding, management, or production efficiency, or for improving the quality of food or fiber. With respect to a dog, the term means all dogs including those used for hunting, security, or breeding purposes;".

SEC. 3. (a) Section 2 of the Animal Welfare Act (7 U.S.C. 2132) is amended by adding at the end thereof the following:

"(k) The term 'pain' means not only hurtful immediate physical sensations resulting in more than momentary distress but also debilitation and significant physical and behavioral suffering.".

(b) Section 2 of the Animal Welfare Act (7 U.S.C. 2132) is amended—

(1) by striking out "and" at the end of subsection (i); and

(2) by striking out the period at the end of subsection (j) and inserting in lieu thereof "; and".

SEC. 4. Section 6 of the Animal Welfare Act (7 U.S.C. 2136) is amended by adding at the end thereof the following: "Elementary and secondary schools shall not be required to register. An individual who is a research facility and who is employed by an institution that is a research facility shall not be required to register.".

SEC. 5. The second sentence of section 13(a) of the Animal Welfare Act (7 U.S.C. 2143(a)) is amended to read as follows: "Such standards shall include proper requirements with respect to handling, housing, feeding, watering, sanitation, ventilation, shelter from extremes of weather and temperatures, space for normal exercise, adequate veterinary care, including the appropriate use of anesthetic, analgesic, or tranquilizing drugs when such use would be proper in the opinion of the attending veterinarian or animal care committee of such research facilities, and separation by species when the Secretary finds such separation necessary for the humane handling, care, or treatment of animals.".

SEC. 6. Section 13(a) of the Animal Welfare Act (7 U.S.C. 2143(a)) is amended by striking out the last sentence thereof.

SEC. 7. The first sentence of section 13(b) of the Animal Welfare Act (7 U.S.C. 2143(b)) is amended by striking out "delivered" and inserting in lieu thereof "transported".

SEC. 8. The Animal Welfare Act is amended by inserting after section 13 (7 U.S.C. 2143) the following:

"SEC. 13a. (a) No research facility shall use live animals for research, testing, or teaching, or for the production of serums, vaccines, or other medical or veterinary products, except under the following conditions:

"(1) Prior to, during, and subsequent to any such research, testing, or teaching, or use for the production of serums, vaccines, or other medical or veterinary products, and while the animal is in the custody and control of the person performing such activities, an animal to be used shall be humanely treated, properly fed, and suitably housed and cared for without pain under the supervision of personnel trained in animal care under methods approved by the Secretary.

"(2) If any such research, testing, or teaching, or use for the production of serums, vaccines, or other medical or veterinary products would involve pain, an animal shall be used only after being adequately anesthetized to preclude pain. The foregoing shall not require anesthesia for the routine procedures integral to the ordinary practice of biomedical research, testing, or teaching which result in momentary pain of minor severity such as subcutaneous, intramuscular, or intravenous injections, the routine collection of body fluids, routine catheterization, or palpations or any procedures which form a part of a routine, and small animal, veterinary clinical practice. Further, such action shall not preclude the infliction of disease by a registered person if the purpose for such infliction is certified to be necessary research by the animal care committee provided for in subsection (b). At the point that such disease causes pain, the animal so inflicted will be given adequate anesthesia or analgesics to preclude such pain unless the animal care committee certifies that such necessary research requires the absence of anesthesia and analgesics, but such withholding of anesthesia or analgesics shall continue for the shortest necessary period of time.

"(3) If the animal would be in pain after the anesthesia or if such animal is not to be returned to normality after the anesthesia, the life of such animal shall be humanely terminated prior to the expiration of the period of anesthesia. Recovery from an operation which removes a nonvital organ and which does not prevent subsequent normal functional activity without pain shall be considered a return to normality. The use of analgesics to obviate pain during a reasonable recovery period after an operation or any other procedure which requires anesthesia shall be considered a satisfactory compliance with this paragraph if pain does not continue after such use is terminated.

"(4) No animal shall be used for any such research, testing, or teaching, or for the production of serums, vaccines, or other medical or veterinary products, in more than one operative procedure from which the animal is allowed to recover. The use of such animal shall not preclude the testing of more than one hypothesis in a single operative procedure nor cumulative sequential operative procedures that are designed to test a single hypothesis, but it shall preclude unrelated operative procedures or repeated operative procedures of the same type not united by a common hypothesis. If an animal is used for such sequential operative procedures, its life shall be humanely terminated prior to the expiration of the period of anesthesia unless the animal may be returned to normality.

"(5) Any such research facility shall be validly registered as required pursuant to section 6, except that elementary and secondary schools may keep live animals for observational studies and for vocational instruction in the normal practices of animal husbandry if such animals are used and kept under conditions not involving pain, and in accordance with section 13a(a)(1).

"(b)(1) Any research facility shall establish and maintain an animal care committee of not less than five members, at least one member of which shall be a doctor of veterinary medicine.

"(2) Any such animal care committee shall be responsible for the adequate care and use of such animals in accordance with the provisions of subsection (a), including the adequate use of anesthetics and analgesics and proper euthanasia, and the keeping of such records as are required by the Secretary. Each proposed project involving the use of animals in a research facility in a manner that could cause pain shall be reviewed by the animal care committee in regard to necessity, facilities available, and other factors relevant under this Act and shall be commenced only if approved by such committee. A complete record of each matter considered by the animal care committee shall be kept by such committee and shall be subject to inspection. The Secretary shall require, by regulation, that each animal care committee submit to the Secretary an annual report describing how such animal care committee has complied with the provisions of this Act.

"(c) For the purpose of consultation and advice, the Secretary shall appoint an advisory committee consisting of not less than ten nor more than twenty-five members. Such committee shall be composed of individuals from the veterinary profession, the medical profession and other biological sciences, individuals representing animal welfare organizations, and the public at large. The members of such committee shall serve without pay but shall be reimbursed for expenses in attending meetings and performing functions of the committee. The Secretary shall establish appropriate procedures for the functioning of such committee.".

SEC. 9. The first sentence of section 14 of the Animal Welfare Act (7 U.S.C. 2144) is amended by inserting after "13" the following: "and shall comply with section 13a".

SEC. 10. The last sentence of section 16(a) of the Animal Welfare Act (7 U.S.C. 2146(a)) is amended to read as follows: "The Secretary shall promulgate such rules and regulations as he deems necessary to permit inspectors to confiscate or destroy in a humane manner any animal found to be suffering as a result of a failure to comply with any provision of this Act or any regulation or standard issued thereunder if such animal is held by (1) a dealer, (2) an exhibitor, (3) a research facility, unless the animal care committee of such research facility certifies that the animal is required by such research facility to carry out the research, test, or experiment for which such animal has been used and unless such use will thereafter be in compliance with this Act and with the regulations and standards issued under this Act, (4) an operator of an auction sale, or (5) an intermediate handler or a carrier.".

SEC. 11. The first sentence of section 19(d) of the Animal Welfare Act (7 U.S.C. 2149(d)) is amended by inserting after "exhibitor," the following: "research facility,".

I

97TH CONGRESS
1ST SESSION

H. R. 220

To promote the development of methods of research, experimentation, and testing that minimize the use of, and pain and suffering to, live animals.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 5, 1981

Ms. FERRARO introduced the following bill; which was referred jointly to the Committees on Energy and Commerce and Science and Technology

---

A BILL

To promote the development of methods of research, experimentation, and testing that minimize the use of, and pain and suffering to, live animals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Humane Methods of Research Act".

SEC. 2. (a) The Secretary of Health and Human Services (hereinafter in this Act referred to as the "Secretary") is authorized to make grants to public and nonprofit private entities (1) to support research into, and the development of, alternatives to present methods of research, experimentation, and testing on animals (including but not limited to analysis of cell, tissue, and organ cultures and computer and other nonanimal modeling), which alternatives require the sacrifice of no live animals and produce less pain and suffering in such animals than methods currently in use; and (2) to establish the validity and reliability of alternatives to present methods of research, experimentation, and testing on animals for the purpose of replacing methods currently in use.

(b) No grant may be made under this Act unless an application therefor has been submitted to, and approved by, the Secretary. Such application shall be in such form, submitted in such manner, and contain such information, as the Secretary shall by regulation prescribe.

(c) The amount of any grant under this Act shall be determined by the Secretary, who shall consider the likelihood that the research and development involved will produce a usable result, and the need of the applicant for assistance, and such other factors as the Secretary may consider relevant. Grants made under this Act may be paid in advance or by way or reimbursement, at such intervals and on such conditions as the Secretary may find necessary, and with appropriate adjustments on account of overpayments or underpayments previously made.

(d) There are authorized to be appropriated to make grants under this Act $12,000,000 for the fiscal year ending September 30, 1982, and $12,000,000 for each of the following four fiscal years.

97TH CONGRESS
1ST SESSION

H. R. 2110

To promote the development of methods of research, experimentation, and testing that minimize the use of, and pain and suffering to, live animals.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 25, 1981

Mr. DONNELLY introduced the following bill; which was referred jointly to the Committees on Energy and Commerce and Science and Technology

---

A BILL

To promote the development of methods of research, experimentation, and testing that minimize the use of, and pain and suffering to, live animals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Humane Methods of Research Act".

SEC. 2. (a) The Secretary of Health and Human Services (hereinafter in this Act referred to as the "Secretary") is authorized to make grants to public and nonprofit private entities (1) to support research into, and the development of, alternatives to present methods of research, experimentation, and testing on animals (including but not limited to analysis of cell, tissue and organ cultures, and computer and other nonanimal modeling), which alternatives require the sacrifice of no live animals and produce less pain and suffering in such animals than methods currently in use; and (2) to establish the validity and reliability of alternatives to present methods of research, experimentation, and testing on animals for the purpose of replacing methods currently in use.

(b) No grant may be made under this Act unless an application therefor has been submitted to, and approved by, the Secretary. Such application shall be in such form, submitted in such manner, and contain such information, as the Secretary shall prescribe.

(c) The amount of any grant under this Act shall be determined by the Secretary, who shall consider the likelihood that the research and development involved will produce a usable result, and the need of the applicant for assistance, and such other factors as the Secretary may consider relevant. Grants made under this Act may be paid in advance or by way of reimbursement, at such intervals and on such conditions as the Secretary may find necessary, and with appropriate adjustments on account of overpayments or under payments previously made.

(d) There are authorized to be appropriated to make grants under this Act $12,000,000 for the fiscal year ending September 30, 1981, and $12,000,000 for each of the following four fiscal years.

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97TH CONGRESS
1ST SESSION

H. R. 930

To establish a commission to study alternative methods to the use of live animals in laboratory research and testing.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 19, 1981

Mr. WEISS introduced the following bill; which was referred to the Committee on Science and Technology

---

A BILL

To establish a commission to study alternative methods to the use of live animals in laboratory research and testing.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Protection of Animals in Research Act".

ESTABLISHMENT

SEC. 2. There is established a commission to be known as the Commission for the Protection of Animals in Research (hereinafter in this Act referred to as the "Commission").

DUTIES OF COMMISSION

SEC. 3. The Commission shall study and recommend alternatives to current procedures in which live animals are used experimentally in laboratory research and testing and shall evaluate the effectiveness of laboratory research and testing using such alternatives.

MEMBERSHIP

SEC. 4. (a) NUMBER AND APPOINTMENT.—The Commission shall be composed of eleven members as follows:

(1) Six individuals appointed by the Speaker of the House of Representatives.

(2) Five individuals appointed by the President, by and with the advice and consent of the Senate.

Appointments made under this subsection shall be from among individuals who are not officers or employees of any government and who will represent the views of animal welfare and humane societies, of medical schools, of individuals engaged in professions involving zoology or wildlife biology, of individuals engaged in the practice of veterinary medicine, and of individuals who have demonstrated administrative or judicial abilities. Appointments shall be made no later than ninety days after the date of enactment of this Act. A vacancy in the Commission shall be filled in the manner in which the original appointment was made.

(b) TERMS.—Members shall be appointed for the life of the Commission.

(c) BASIC PAY.—Members of the Commission shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS–18 of the General Schedule.

(d) QUORUM.—Six members of the Commission shall constitute a quorum but a lesser number may hold hearings.

(e) CHAIRPERSON.—The Chairperson of the Commission shall be elected by the members of the Commission. The term of office of the Chairperson shall be for the life of the Commission.

(f) MEETINGS.—The Commission shall meet at the call of the Chairperson or a majority of its members.

STAFF OF COMMISSION; EXPERTS AND CONSULTANTS

SEC. 5. (a) STAFF.—The Commission may appoint and fix the pay of such personnel as it considers appropriate.

(b) APPLICABILITY OF CERTAIN CIVIL SERVICE LAWS.—The staff of the Commission shall be appointed subject to the provisions of title 5, United States Code, governing appointments in the competitive service, and shall be paid in accordance with the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates.

(c) EXPERTS AND CONSULTANTS.—The Commission may procure temporary and intermittent services under section 3109(b) of title 5 of the United States Code, but at rates for individuals not to exceed the daily equivalent of the maximum annual rate of basic pay payable for GS–18 of the General Schedule.

(d) STAFF OF FEDERAL AGENCIES.—Upon request of the Commission, the head of any Federal agency is authorized to detail, on a reimbursable basis, any of the personnel of such agency to the Commission to assist the Commission in carrying out its duties under this Act.

POWERS OF COMMISSION

SEC. 6. (a) HEARINGS AND SESSIONS.—The Commission may, for the purpose of carrying out this Act, hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence, as the Commission considers appropriate. The Commission may administer oaths or affirmations to witnesses appearing before it.

(b) POWERS OF MEMBERS AND AGENTS.—Any member or agent of the Commission may, if so authorized by the Commission, take any action which the Commission is authorized to take by this section.

(c) OBTAINING OFFICIAL DATA.—The Commission may secure directly from any department or agency of the United States information necessary to enable it to carry out this Act. Upon request of the Chairperson of the Commission, the head of such department or agency shall furnish such information to the Commission.

(d) GIFTS.—The Commission may accept, use, and dispose of gifts or donations or services or property.

(e) MAILS.—The Commission may use the United States mails in the same manner and under the same conditions as other departments and agencies of the United States.

(f) ADMINISTRATIVE SUPPORT SERVICES.—The Administrator of General Services shall provide to the Commission on a reimbursable basis such administrative support services as the Commission may request.

REPORT

SEC. 7. The Commission shall transmit to the President and to each House of the Congress reports at least annually and shall transmit a final report to the President and to each House of the Congress before the termination of the Commission under section 8. Such reports shall contain a detailed statement of the activities, findings, and conclusions of the Commission, together with its recommendations for such legislation and administrative actions as it considers appropriate.

TERMINATION

SEC. 8. The Commission shall cease to exist five years after the date of enactment of this Act.

AUTHORIZATION OF APPROPRIATIONS

SEC. 9. There is authorized to be appropriated to carry out this Act not to exceed $750,000 for each of the fiscal years ending on September 30, 1982, September 30, 1983, September 30, 1984, September 30, 1985, and September 30, 1986.

IV

97TH CONGRESS
1ST SESSION

H. CON. RES. 38

Pertaining to the methods used on animals in research.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 22, 1981

Mr. WHITEHURST submitted the following concurrent resolution; which was referred jointly to the Committees on Energy and Commerce and Science and Technology

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CONCURRENT RESOLUTION

Pertaining to the methods used on animals in research.

Resolved by the House of Representatives (the Senate concurring), That it is the sense of Congress that the Federal Government should take appropriate steps to develop new research methods for its research projects, where feasible, to complement or eliminate current methods involving the direct or indirect use of animals; and that no Federal funds should be provided for research projects involving the direct or indirect use of animals if other methods, such as but not limited to computers, tissue culture, radionuclide techniques, chromatography, spectometry, nonanimal models, lower organisms, or dummies, can be successfully substituted.

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